Covering the TI99/4A, the Myarc 9640 and compatibles

MICROpendium

Volume 4 Number 6 July 1987 $1.50

Lone Star quilt pattern

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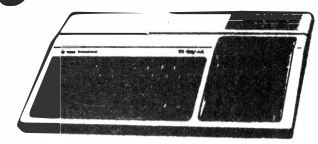

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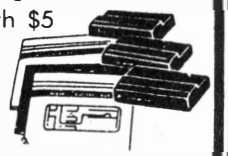

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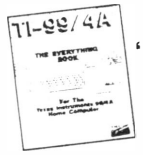

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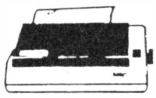

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Comments

Downloading the DOS on Geneve

Myarc released a partial version of its disk operating system for the Geneve in mid-July. The program turned up on all the national telecommunications networks overnight, as it were, available for downloading by anyone. The final version will likely first appear on the networks, too. The idea is to get it out as quickly as possible to as many users as possible. There's no concern about piracy, since the program will run only on the Geneve.

This operating system in progress is built around Myarc's GPL interpreter and is less an operating system than it is an environment. Through it you can load virtually any TI software — Extended BASIC, Editor/Assembler, Multiplan, etc. — and then load your favorite program — an Extended BASIC application or game, Forth, a spreadsheet, etc. Essentially, this version of M-DOS, admittedly unfinished, serves as a host for TI cartridges that have been saved to disk. One may also load Myarc's XBII. This version of M-DOS (numbered .8) also allows the user to select operating speeds, from one to five — five being the fastest. Multiplan runs in five, most other things can run in three. One is for the slower, timing-critical software. At this point, I don't know what that is.

The primary improvement of this version of M-DOS over the GPL interpreter is that it support most of the I/O functions that the interpreter didn't. Multiplan, for example, works fine. One can load and save spreadsheets with M-DOS .8, which couldn't be done with the GPL interpreter that was released in June. While I've encountered a couple of problems addressing a printer with this operating system — primarily through programs such as TI-Count — the problem has not been consistent. LISTing programs in Extended BASIC has been no problem.

ODDLY, I'VE HAD SOME PROBLEMS ACCESSING A DISK IN DRIVE 2 WHILE USING MULTIPLAN AND MYWORD, MYARC'S TI-WRITER UPGRADE. ONE THING THAT HAPPENED, AS IS EVIDENCED HERE, IS THAT AFTER FAILING TO ACCESS DRIVE 2 AND THEN SUCCESSFULLY ACCESSING DRIVE 1, THE TEXT MODE TURNED INTO UPPERCASE. THIS PARAGRAPH IS IN UPPERCASE SIMPLY BECAUSE I WAS NOT ABLE TO GET IT INTO LOWERCASE WITHOUT RELOADING MYWORD.

Rebooting the system ended the problem. I've also found that loading the help screen and then returning to the editor solves the problem, though I have no documentation to prove it.

It is nice to use a the 80-column Multiplan, with its much-increased speed. However, not all the functions of the 80-column version are called exactly as in the 40-column version. (The 80-column Multiplan that I have is one of the earliest released by Myarc and may not have all the improvements that were planned.) Even so, Multiplan displays a disk directory in several columns, reducing if not eliminating the need to page through a disk to find a file to load.

Geneve users should be thrilled that Myarc released M-DOS at this time. I was afraid that the company was going to wait until a final product was ready, thus frustrating those who have the machine but not software. At least now most users should be able to run their TI software and get accustomed to the new machine. I don't buy the argument that a company should wait until everything is perfected before issuing a product such as a new computer. Virtually every company, from Apple to Atari and IBM, releases machines and software before they have been perfected. To wait until every bug is corrected could cost them the market. I don't necessarily agree with this approach, but it is the way that many computer companies do business. And with far more expensive devices than a $500 CPU.

The biggest drawback, at this point, is the absence of documentation for My-Word and the 80-column Multiplan. It's frustrating to know that My-Word is a souped-up word processor and not be able to take advantage of its features because I don't know what they are. The Geneve manual remains irrelevant, though this should change when the final M-DOS is released.

Although we promoted a review of M-DOS in last month's edition, the current status of the program is such that a review isn't feasible. Too much can change between this version and the final version, and I'm already confused enough.

MACK HAS LEFT THE FOLD

Sad to say, our technical editor, Mack McCormick, has resigned his position. Recently promoted to major, Mack is becoming too busy with his military duty in Europe to continue writing for MICROpendium. We'd like to hear from others who can pick up where Mack left off.

TI/IBM CONNECTION

CorComp's cartridge that translates PC text files for use with the 99/4A, and vice versa, could turn into a very popular piece of software. I've tried it, and it works. It's faster than a similar program that we use to translate articles for use by our typesetter. At $49.95, it's also a lot cheaper. Already, in response to initial users, CorComp has rewritten the documentation, though I found the program to be easy to use even without documentation. The program is available from Tex-Comp. Unfortunately, it runs only with the CorComp disk controller, so those with Myarc or TI are out.

—JK

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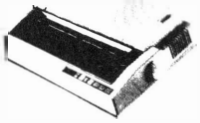

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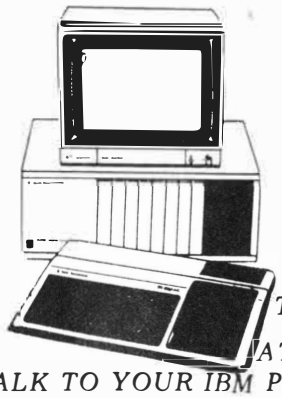

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Feedback

More about modifying consoles

I read with interest . . . an article describing how a fellow had added 128 more bytes of 16 bit CPU RAM inside the console. He is to be commended for his effort. I am writing, however, to inform you that for almost two years now I have been running a couple of consoles which I have modified to include the full 32K on the 16 bit data bus.

A number of people in this area have also made the conversion and are quite happy with it. Programs will operate up to twice as fast, and the only problems encountered are when the programmers didn't follow TI's guidelines for accessing VDP, namely, waiting between each byte written or read. M/L programmers will know what I mean. Fortunately, these problems are very rare.

I have published [articles on how to build the two versions of this memory for two respective consoles] in The Clubline 99, Hamilton's newsletter/magazine. Incidentally, if anyone wants copies of those articles, contact Clubline at P.O. Box 1005, Station A, Hamilton, Ontario, Canada L8N 3R1.

Remember to specify which console you intend on modifying (black/silver or beige).

Ron Marissen
St. Thomas, Ontario, Canada

Language compiler desired by user

Word processors still aren't fast enough to set up for short notes.

There has been a lot more growth in TI99/4A software and hardware than I would have thought possible after "Black Friday," but as far as I'm concerned there has been no movement in the most necessary direction.

That is, a modern, structured language compiler. I would like to leap ahead and have Modula-2 but if only a structured BASIC would sell I can accept that. C99 is a joke—I *told* them don't send it to me if the floating point functions aren't full C; and you know how *bad* they are. I refused to pay.

Hank Hudgins
Sussex, New Jersey

Program line lengths

I would like a question answered on the entry of TI99/4A computer programs out of magazines.

I have tried to type in the file dump program in hex and ASCII from your June 1987 issue but the lines in 180 are too long to fit in my computer. What are you or am I doing wrong? Why do you people do this to the public? We depend on you for good programs and they always end up with the lines too long. I would really like to know why this happens.

James H. Webb Jr.
Tampa, Florida

Extra long program lines are entered by using the FCTN REDO key. For example, you would begin by entering as much of the program line as possible. The cursor will not move after the fifth line but will stay at the lower righthand corner of the line. Press enter. Now press FCTN REDO and the line will reappear. Position the cursor as the end of the program line and continue typing.

We have published this information in previous issues and neglected to point it out again in the article you mention.

Questions regarding system upgrades

As a long time subscriber I want to express my appreciation for your fine service to those of us who own a TI99/4A and ask your assistance with a problem many of us face, specifically, how do we upgrade our hardware to add disk capability and how do we put our cassette programs onto the disk without rekeying?

My basic system consists of a TI99/4A console, a cassette player and an Axiom GP-100TI printer. I have studied the ads for the CorComp Expansion System but do not know what parts I need (full size vs. half height, SS/SD vs. DS/DD disk drive?) and most importantly whether the expansion system has a *side port* for my Axiom printer, speech synthesizer and TI thermal printer.

If expansion to disk capability can be done, then comes the question of my extensive software collection currently on cassette tape. Can I load the programs into the computer and "save" them onto the disk?

I know these questions may seem easy to experienced TI operators but they are of overwhelming concern to me and many other TI99/4A owners who would like to grow with our machine.

Steve Gendler
Fountain Hills, Arizona

CorComp recommends ½ height drives for its expansion system. Yes, any device meant to be daisy-chained through a side-port may be connected to the system. With the proper cabling, an Axiom printer will work with the system.

As for transferring cassette software to diskette, many BASIC programs can be transferred simply by loading them from cassette into memory and then saving them to disk. Long cassette programs may create a problem because not all of the console memory available to a cassette system is available to a disk system. The reason being that a disk system takes up about 1K of the RAM memory in the console. Thus, while you may be able to load a 12K+ program from cassette, it won't run if the disk system is turned on. An expansion memory won't help because it can't be accessed from BASIC. Solutions to this problem vary — and we've published a number of them. (Some are more effective than others.)

One method is to break a program in half by deleting half the lines (turn the disk system off it the tape can't be loaded with it on), and save the truncated program to tape. Then reload the program from tape, delete the previously saved half and save it to tape. Then turn the system on and load one program half from tape and save in MERGE format to disk. Do the same with the other half. Then, merge the two program halves from disk and save the entire program to disk. This solution appeared in the December 1986 MICROpendium and came from Jerry Keisler of Paris, Texas.

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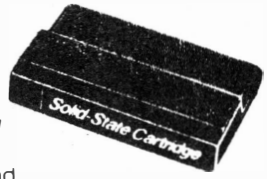

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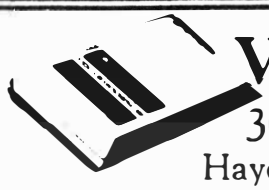

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BASIC

Lone Star Quilt ★

By REGENA

One of my favorite programs is the Quilt Squares program originally written for the TI in *Enthusiast '99,* January 1984. I have since translated (and improved) the program for nearly all the other computers I have. In that program, you can choose two, three or four colors for a quilt, then design a basic square. The basic square consists of 16 smaller squares which can be squares or right triangles. After you design the basic square, the screen fills with the pattern so you can see what a patchwork quilt would look like—computerized quilting.

This month's program is a variation of that program. The Lone Star Quilt program lets you choose colors for a particular quilt pattern, the popular lone star pattern. Only the lone star pattern is used in this program. In this pattern the diamond-shaped quilt pieces radiate outward from the center eight-pointed star. Although you can really use any color of diamonds anywhere in the pattern, usually you use "rings" of color. The center star is one color, then the surrounding diamonds are of a different color. As you move outward, the colors change. The computer keeps track of the diamonds, and when you choose a color it will automatically color all the proper diamonds that color. You can design a quilt without actually having to piece all those little diamonds together.

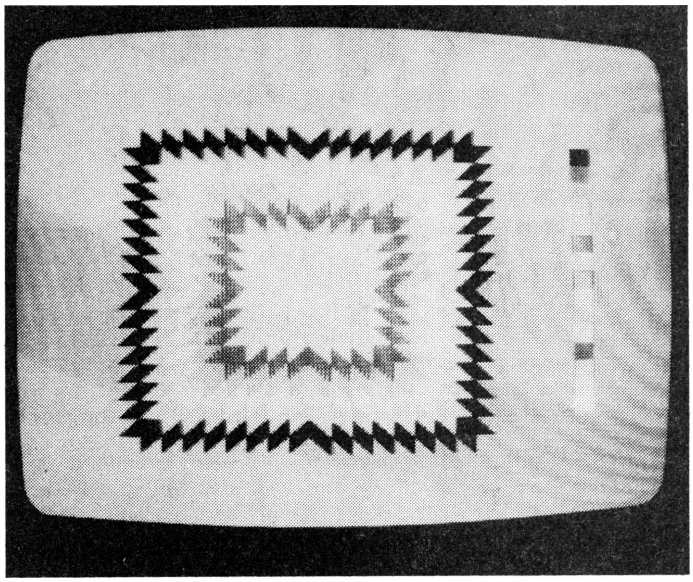
The possible colors for the quilt diamonds are shown at the right of the screen. Use the up arrow key or down arrow key to move the indicator arrow to choose the color. When the arrow points to the color you want, press the ENTER key. Starting with the center star and moving outward, you may choose one color at a time and the diamonds will appear in the quilt pattern.

After the quilt has eight diamond "rings," the computer goes back to the center star and you can change colors. A blinking square indicates which "ring" you are on to change colors.

The color squares shown at the right of the screen use all the colors from 2 (black) to 16 (white) in order. You'll need to be careful if you use the light green that is the existing screen color because you may not be able to see the edges of the diamonds.

Lines 160-170 define variables. BK is used as the background color number, and FLAG is equal to 1 for the first time through the choosing colors routine. The first time through, each diamond as you move outward needs to have the transparent background. Later times through, the value of FLAG changes and the background color is the previous color of the diamonds already on the screen.

Lines 180-220 print some brief instructions. Line 230 redefines character 35 to be the arrow shape used in choosing the colors. Lines 240 and 250 define ROW and COL where the arrow moves when you choose colors. Lines 260-360 define characters which will be used to print the diamond shapes in the lone star pattern. There are eight different shapes needed for the pattern, and fortunately each color set allows eight characters. These



characters are defined for each color set numbered from 9 to 16. This allows eight different colors to be chosen for the quilt. Lines 370-390 wait for the user to press the ENTER key to start.

Line 400 clears the screen, then Lines 410-470 print the color squares at the right side of the screen. For each of the first eight color sets, the first character is defined as the null string and the second character as a full, filled-in square. Lines 480-540 then define the colors for the squares in each set. Line 550 places the arrow on the screen next to the color squares.

Line 560 defines the variable T to be 1, which means the first colored diamonds will be drawn. Line 570 calls the subroutine starting with Line 1010 to choose the color. Lines 580-710 then draw the center star, which includes four solid squares of color then eight triangular shapes around the square. GCN is the character number of the particular color square chosen, and it is used to draw all necessary solid squares in the design.

Lines 720-960 then draw diamond shapes around the original star. Notice there is a pattern of where the solid squares appear in the corners and the number of repeating triangular shapes. A and B are used as coordinates, and C is a character number.

Line 970 redefines FLAG after the first pattern is drawn, then Line 980 branches back to Line 560 to repeat the color-choosing process.

Lines 1000-1310 include the subroutine to choose the color. X and Y are coordinates of the solid square in the particular ring of diamonds to be drawn. G is the character number of that square, which is used to blink a square. Within the CALL KEY loop in Lines 1050-1090, the arrow and the square blink. Lines 1100-1120 make sure the ENTER key or the arrow keys are chosen and all other keys are ignored. The arrow keys may be pressed as FCTN-E, E or lowercase e and FCTN-X, X and x. The ROW number is used to determine where the arrow is and which color set is needed to get the correct color number CLR.

See Page 12

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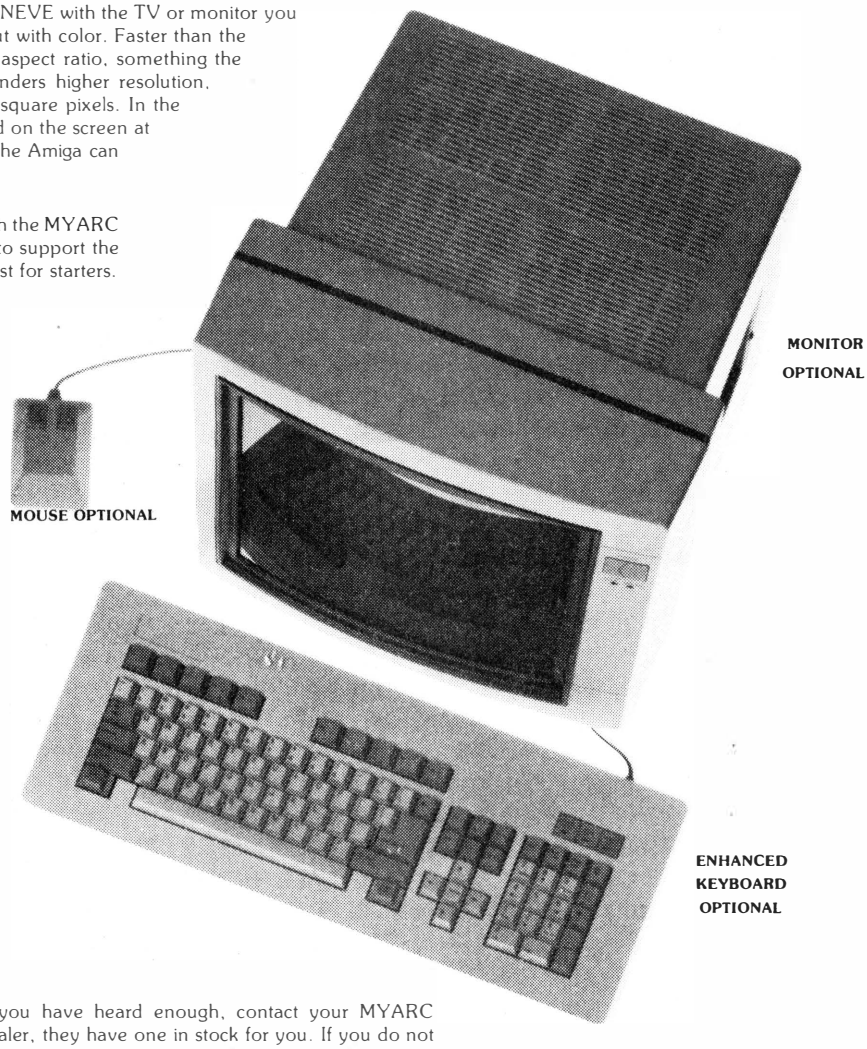

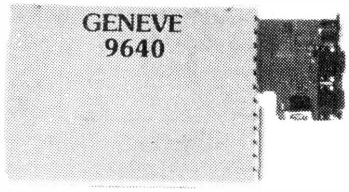

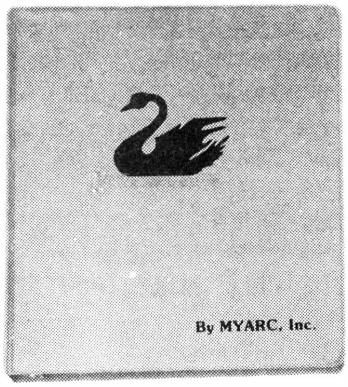

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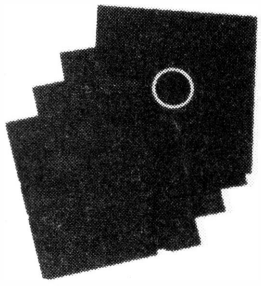

REGENA—

Continued from Page 10

If you prefer to save typing effort, you may have a copy of this program by sending $3 and a blank cassette or diskette and a stamped, self-addressed mailer to **Regena, P.O. Box 1502, Cedar City, UT 84720.** *Be sure to specify the program name and that you need the TI version.*

LONE STAR QUILT

```
100 REM  LONE STAR QUILT
110 REM  BY REGENA
120 REM  P. O. BOX 1502
130 REM  CEDAR CITY, UTAH  8
4720
140 CALL CLEAR
150 PRINT "    LONE STAR QUI
LT"
160 BK=1
170 FLAG=1
180 PRINT ::"USE THE ARROW K
EYS TO SELECT"
190 PRINT :"COLORS IN THE LO
NE STAR"
200 PRINT :"PATTERN.  CHOOSE
 A COLOR"
210 PRINT :"WITH THE ARROWS
THEN PRESS"
220 PRINT :"<ENTER>."
230 CALL CHAR(35,"102040FF40
201")
240 ROW=5
250 COL=29
260 FOR SET=9 TO 16
270 CN=32+8*(SET-1)
280 CALL CHAR(CN,"80C0E0F0F8
FCFEFF")
290 CALL CHAR(CN+1,"00010307
0F1F3F7F")
300 CALL CHAR(CN+2,"FFFEFCF8
F0E0C08")
310 CALL CHAR(CN+3,"0080C0E0
F0F8FCFE")
320 CALL CHAR(CN+4,"FF7F3F1F
0F070301")
330 CALL CHAR(CN+5,"FEFCF8F0
E0C08")
340 CALL CHAR(CN+6,"0103070F
1F3F7FFF")
350 CALL CHAR(CN+7,"7F3F1F0F
070301")
360 NEXT SET
370 PRINT ::"PRESS <ENTER> N
OW TO START."
380 CALL KEY(0,K,S)
390 IF K<>13 THEN 380
400 CALL CLEAR
410 FOR SET=1 TO 8
420 CN=32+8*(SET-1)
430 CALL CHAR(CN,"")
440 CALL CHAR(CN+1,"FFFFFFFF
FFFFFFFF")
450 CALL HCHAR(2+SET*2,28,CN
)
460 CALL HCHAR(3+SET*2,28,CN
+1)
470 NEXT SET
480 CALL COLOR(2,4,3)
490 CALL COLOR(3,6,5)
500 CALL COLOR(4,8,7)
510 CALL COLOR(5,10,9)
520 CALL COLOR(6,12,11)
530 CALL COLOR(7,14,13)
540 CALL COLOR(8,16,15)
550 CALL HCHAR(ROW,COL,35)
560 T=1
570 GOSUB 1010
580 CALL HCHAR(12,14,GCN,2)
590 CALL HCHAR(13,14,GCN,2)
600 IF FLAG=1 THEN 620
610 BK=CL(2)
620 CALL COLOR(9,CLR,BK)
630 CL(1)=CLR
640 CALL HCHAR(11,14,96)
650 CALL HCHAR(11,15,97)
660 CALL HCHAR(12,16,98)
670 CALL HCHAR(13,16,99)
680 CALL HCHAR(14,15,100)
690 CALL HCHAR(14,14,101)
700 CALL HCHAR(13,13,102)
710 CALL HCHAR(12,13,103)
720 FOR T=2 TO 8
730 GOSUB 1010
740 CL(T)=CLR
750 CALL COLOR(7+T,CL(T-1),C
L(T))
760 CALL HCHAR(13-T,15-T,GCN
)
770 CALL HCHAR(13-T,14+T,GCN
)
780 CALL HCHAR(12+T,15-T,GCN
)
790 CALL HCHAR(12+T,14+T,GCN
)
800 BK2=1
810 IF FLAG=1 THEN 840
820 IF T=8 THEN 840
830 BK2=CL(T+1)
840 CALL COLOR(8+T,CL(T),BK2
)
850 A=12-T
860 B=15-T
870 C=8*T+88
880 CALL HCHAR(A,B,C,T)
890 CALL HCHAR(A,15,C+1,T)
900 CALL VCHAR(A+1,B+T*2,C+2
,T)
910 CALL VCHAR(13,B+T*2,C+3,
T)
920 CALL HCHAR(A+2*T+1,15,C+
4,T)
930 CALL HCHAR(A+2*T+1,B,C+5
,T)
940 CALL VCHAR(13,B-1,C+6,T)
950 CALL VCHAR(A+1,B-1,C+7,T
)
960 NEXT T
970 FLAG=2
980 GOTO 560
990 STOP
1000 REM  CHOOSE COLOR
1010 CALL SOUND(100,1400,2)
1020 X=13-T
1030 Y=15-T
1040 CALL GCHAR(X,Y,G)
1050 CALL KEY(0,K,S)
1060 CALL HCHAR(ROW,COL,32)
1070 CALL HCHAR(X,Y,32)
1080 CALL HCHAR(ROW,COL,35)
1090 CALL HCHAR(X,Y,G)
1100 IF K=13 THEN 1230
1110 IF (K=11)+(K=69)+(K=101
)THEN 1190
1120 IF (K<>10)*(K<>88)*(K<>
120)THEN 1050
1130 REM  DOWN
1140 IF ROW+1>19 THEN 1050
1150 CALL HCHAR(ROW,COL,32)
1160 ROW=ROW+1
1170 GOTO 1050
1180 REM  UP
1190 IF ROW-1<5 THEN 1050
1200 CALL HCHAR(ROW,COL,32)
1210 ROW=ROW-1
1220 GOTO 1050
1230 CALL SOUND(100,1400,2)
1240 SET=(ROW-2)/2
1250 IF SET=INT(SET)THEN 128
0
1260 CLR=INT(SET)*2
1270 GOTO 1290
1280 CLR=SET*2-1
1290 SET=INT(SET)
1300 CALL GCHAR(ROW,COL-1,GC
N)
1310 RETURN
1320 END
```

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Getting more from Forth

Integrating machine code into Forth

By ROD COOK

Generally, a Forth routine will execute fast enough to satisfy most program needs. But there are circumstances when the routine will not perform the desired function fast enough. The required speed is usually application dependent, but sometimes the programmer simply wants something to execute faster.

The programming environment of Forth is ideal for reintegrating machine code into the program. Usually the routine has already been designed to execute in Forth and, therefore, the algorithm is established. The conversion of a Forth routine to its machine code equivalent through the Forth assembler provided is remarkably straightforward and in some respects is simpler than writing machine code with the Editor/Assembler.

The purpose of this article is to introduce the method of converting a Forth routine to machine code using the assembler provided with the TI version of Forth.

Refer to Fig. 1 for definitions of several Forth words.

The routine in Fig. 1 is executed by putting an address on top of the stack followed by the word DISPLAY. It will successively read 256 bytes starting at the address you have specified, convert the byte value to ASCII, store the ASCII values in a buffer and finally write the buffer to VDP RAM to display on the screen. Note that the Forth definitions are written in hexadecimal. This was chosen primarily because later on in this article, when the machine code is present in the definitions, this code is best expressed in hex. By convention, hex numbers will be preceded by the greater than symbol (>). The absence of this character implies a decimal number. There's no better time than the present to start thinking in hex.

The first line saves the current operating system number base to the R stack and then the number base is converted to hex (base 16). Whenever the word BASE->R is used it must be followed by the word R->BASE which returns the operating system number base back to its original value. Note that this word appears at the end of the definitions.

The next line sets up the buffer in which to store the ASCII values. 0 VARIABLE VBUF defines a variable named VBUF that contains a 16-bit variable value that has been initialized to 0000. When VBUF is executed, the address of the variable location is left on the top of the stack. To get the actual value of the variable would require the fetch instruction (@) which places the value on top of the stack. The >200 ALLOT reserves the next >200 bytes (512d) to be used as the buffer for the ASCII values. Therefore, this area of memory will not be used to store definitions.

The next line defines another variable, called ADDR, with an initial value of >0000. This variable is used to store the address that is on top of the stack when the word DISPLAY is executed.

The root algorithm is the conversion of a byte of memory to its ASCII value. Al byte of memory is commonly expressed in the hexadecimal form because converting hex to binary is easy, while mental conversion of decimal to hex or binary is not straightforward.

The object of the program is to display >100 successive memory locations on the screen in hex format. For example, a byte that contains the binary value 11110100 is expressed as >F4, we want to display F4 on the screen.

To display anything on the screen will involve transferring information from console RAM to VDP RAM. But, if >F4 is transferred to VDP RAM you will not see F4 on the screen. To display F4 on the screen, the ASCII value of >F and >4 must be put in adjacent VDP locations. The ASCII value of >F is >46 and of >4 is >34. To convert >F4 to its equivalent ASCII value would be to remove >F4 from the top of the stack and replace it with >4634.

The hex characters are 0 through 9 and A through F, and the equivalent ASCII values are >30 through >39 and >41 through >46, respectively. Each byte is made up of two hex digits, called nibbles. Each nibble must be converted to its ASCII value separately then recombined and put back on the stack. Note that the one byte of memory (>F4) requires two bytes of memory for its ASCII equivalent (>4634). Thus >100 bytes of memory will require >200 bytes to store the ASCII values.

The algorithm to convert a byte to its ASCII values follows. Let's assume we know how to divide the byte into its equivalent nibbles so that one nibble is on top of the stack and the second nibble next in the stack. Then we can first convert the nibble on top of the stack, SWAP the two stack values and convert the other nibble.

Look at the definition for ASCII in Fig. 1. It expects to find a value on top of the stack between >0 and >F. Hex >30 is added to it, so now the value on the stack is between >30 and >3F. If the original nibble that was on the stack was between >0 and >9, no further conversion is necessary since the ASCII value for this range is >30 to >39. But, if the original value was an >A through >F, then the value on the stack after adding >30 will be >3A through >3F and these must have an additional >7 added to them to convert them to the range >41 through >46.

(See Page 16)

Fig. 1

```
   BASE->R HEX
0 VARIABLE VBUF 200 ALLOT
0 VARIABLE ADDR
: ASCII  30 + DUP 39 > IF 7 + ENDIF ; ( nibble --- b )
: CONVB  10 /MOD SWAP ASCII SWAP ASCII 100 * + ; ( b --- c )
: HXFER  100 0 DO ADDR @ I + C@ CONVB VBUF I 2 * + ! LOOP ;
: SHOW   CLS VBUF 50 100 VMBW ;
: DISPLAY  ADDR ! HXFER SHOW ; ( addr --- )
   R->BASE
```

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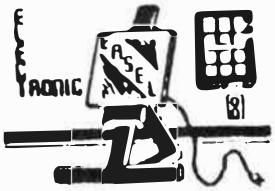

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FORTH—

(Continued from Page 14)

respectively. The remainder of the definition for ASCII compares the value after the addition to >39. If the value is greater, >7 is added. The ASCII value will be left on top of the stack.

Back to the question of how to divide a byte into its nibbles. Consider this scenario: Any two-digit number divided by its number base will yield the left digit as the dividend and the right digit as the remainder. For example, the decimal number 27 when divided by its number base 10 yields a dividend of 2 with a remainder of 7.

In the same manner, dividing a two-digit hex value by its number base of 16 (>10) with the /MOD word will leave the left nibble on top of the stack and the right nibble (remainder) in the next position on the stack. Look at the definition for CONVB in Fig. 1. The first part divides the byte into its nibbles, the second part calls the ASCII routine twice swapping the values in between and, finally, the two ASCII values are recombined by multiplying the top stack value by >100 (does the same as shifting 8 bits to the left) and adds the other ASCII value leaving the combined value on top of the stack.

All of the above converts only one byte. To convert >100 bytes, then, this must be repeated as many times. This implies a DO-LOOP. Look at the definition for HXFER. This definition accomplishes the conversion of the successive bytes in memory. The loop is set up to loop from >0 to >100. Within each loop the value of the starting address is obtained by the ADDR @ words. Then the value of the loop index is added to this base address by the words I + . The top of the stack now contains the address of the byte to be read and converted to ASCII. The byte is read by the @C word leaving the two-digit hex value on top of the stack. The word CONVB will convert this value to its equivalent ASCII value and leave this on top of the stack.

Now the ASCII values must be stored in the buffer defined by VBUF. Remember that each byte requires two bytes for the ASCII value and, accordingly, the VBUF addresses must be incremented by a factor of two.

The next words in the definition after CONVB will get the base address of VBUF, get the loop index and multiply the index by 2, add this to the base address of VBUF and, finally, store (!) the ASCII value at this address. Then the loop repeats until done.

The other definitions in Fig. 1 (SHOW and DISPLAY) should be relatively self-explanatory. The reader is advised to get out the Forth manual and wade through the Forth code step by step if the operation of this program is unclear.

Note that on execution of this routine there is a slight delay, no more than a second, between the time the enter key is pressed and the display is generated. For the purpose of demonstrating the integration of machine code into Forth, we will reduce this time delay by rewriting several of the Forth definitions in machine code using the Forth assembler to generate the code.

Compiling assembler code requires that the assembler screens be loaded. Do this by keying 75 LOAD then enter. Also, we will be modifying the definitions in Fig. 1 and recompiling. We will periodically want to FORGET the defined words. So, first key in FORGET VBUF followed by enter, then load screen 75. From this time on when you say FORGET VBUF the assembler definitions will not be forgotten also.

The word CONVB is executed 256 times but the word ASCII is executed 512 times. The definition of ASCII is the first target to redefine into machine code to reduce execution time, since it is repeated so many times during the conversion.

You should review the discussion of assembler in the Forth manual (Chapter 9, pages 1-8). Further, you should have some understanding of the assembler instruction set, workspace registers and addressing modes.

When you load the assembler screens (75 LOAD) you will get a message that says "C, isn't unique.". This means that there is already another word with the name of C, but it is contained in a different vocabulary than the present assembler words are being compiled into.

In the Forth vocabulary, C, means *store 8 bits into the next available dictionary location* while in the Assembler vocabulary it means the assembler instruction *compare Words*. Depending on which vocabulary is current, the appropriate definition of C, will be used. If in the assembler code the instruction C, is not used, then the Assembler vocabulary does not have to be the current vocabulary and, accordingly, if C, is an instruction in your code you must set Assembler as the current vocabulary. Otherwise, the wrong definition of C, may be executed.

The same is true if you have written Forth code using the word C, to store 8 bits. Forth must be the current vocabulary. Later on we will talk about compiling the actual machine code into memory without having to have the assembler screens loaded, thus avoiding this messy situation when there are words with the same name.

To format of an assembly definition is the word CODE followed by the name of the definition. This assembler instructions follow these and the last word in the definition must be NEXT, .

CODE ASCII ... assembler instructions ... NEXT,

The NEXT, word returns execution to the next Forth word in the calling definition.

Before converting the Forth definition of ASCII to assembler code, we need to talk about how to use data from the stack in the machine code routine. There is a fundamental difference between Forth and Assembler. Forth numbers are manipulated on the stack. Assembler numbers are manipulated between the workspace registers. The registers and the stack are not the same thing. Forth's workspace is located at address >8300 (see memory map in Chapter 4, page 5 of the Forth manual) and the stack actually starts at address >FF9F (see memory map in Chapter 4, page 6).

As values are added to the stack the address of the top of the stack moves in increments of 2 to lower memory values. For example, the diagram in Fig. 2 illustrates the values and addresses contained in the stack if the stack contains two values, >000F on the top and >0004 next.

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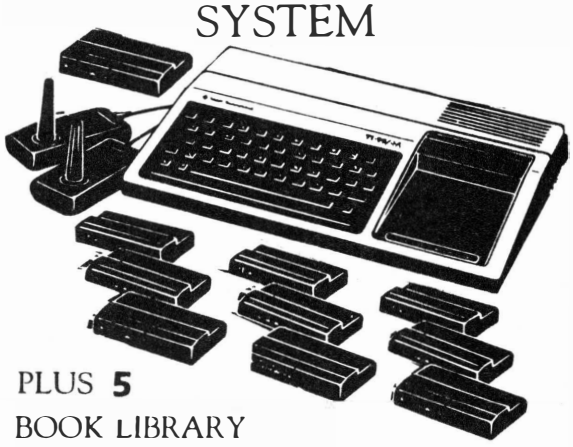

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FORTH—

(Continued from Page 16)

Fig. 2

ADDR in RAM	Contents
>FF9A	future top of stack if three
>FF9B	values on the stack.
>FF9C	>000F stored here;
>FF9D	>current top of the stack.
>FF9E	>0004 stored here;
>FF9F	bottom of the stack.

>0004 is stored at >FF9E. Each stack location is two bytes, in this case addresses >FF9E and >FF9F. Address >FF9E contains >00 and >FF9F contains >04. The value >000F is stored at >FF9C and >FF9D. Register 9 of Forth's workspace contains the address of the top of the stack and is called parameter Stack Pointer (SP). Refer to the listing of Forth's workspace registers (Chapter 9, page 3). In Fig. 2, register 9 would contain >FF9C. Therefore, to move data from the stack to the registers, an assembler instruction like MOV *R9,R0 will move the 16 bits at the address specified in register 9 to register 0.

If you wanted the second value from the top of the stack, the address in register 9 would need to be incremented by 2. Then an instruction similar to the above is specified. With some thought you should realize that you have to absolutely keep track of where the top of the stack was, and where you want it to be when you're done and make sure the address in register 9 contains the correct address before you exit the machine code to return to the calling definition. You probably should limit yourself to working with registers 0 through 7 and register 9, leaving the rest alone because they are used by the Forth operating system.

Following is the assembler code that replaces the Forth definition of ASCII:

Fig. 3

```
CODE ASCII
*SP 0 MOV,
0 30  AI,
0 39  CI,
  GT  IF,
      0 7 AI,
      ENDIF,
0 *SP MOV,
      NEXT,
```

The assembler code in Fig. 3 should be substituted for the definition of ASCII in the listing. Note that since C, is not an instruction in the assembler listing, the Assembler vocabulary does not have to be current. Also, the colon and semicolon defining words are not used either.

The first line is the name of the machine code routine. The second line moves the 16 bits pointed to by the address contained in register SP to R0. Note that SP and 9 can be used interchangeably to represent R9. Remember that the value on top of the stack is a nibble.

The third instruction adds >30 to the value in R0. The fourth instruction immediately compares the value in R0 to >39 and sets the status bits accordingly. The next line contains the assembler jump token GT which, based on the previous comparison, establishes a true condition if the value in R0 was greater than >39 or false if it was not.

The IF, ... ENDIF, defines a structured assembler construct that — as in regular Forth code — if a true condition exists, the instructions between the IF, and the ENDIF, will be executed. If a false condition exists they are skipped. So, if a true condition exists then >7 is added to the value in R0.

The MOV, instruction in the next to the last instruction does the opposite of the first MOV, instruction. The value in R0 is moved to the address specified in SP. This is how the workspace register and the stack are linked. Finally, the last instruction returns to the calling routine.

It is interesting to note the similarity in the structure of the assembler code to the Forth definition. Certainly this may not always be the case, but the sequence of events within a Forth definition will most likely be transportable. Establishing a logical sequence to accomplish a task is half the job.

The other remarkable point about the assembler code within Forth is the availability of the higher level structured constructs, such as IF,..ENDIF, BEGIN,...UNTIL,BEGIN,...WHILE,...REPEAT,. These kinds of structures are not available within the Editor/Assembler system — you have to develop them yourself with code. The higher level constructs further accentuate the transportability of Forth code to assembler code.

Now execute the program again, noting the delay after the enter key is pressed. Be sure to FORGET VBUF and load the assembler screens *before* recompiling the display routine.

Well, there is still a delay. In fact, the time difference is hardly noticeable. Executing ASCII in machine code does not significantly reduce the delay.

Execution time must have been reduced a small amount but, apparently, this is not the time-consuming procedure. The next step is to code the next most executed

(See Page 20)

Fig. 4

Code CONVB	define name
*SP 0 MOV,	move top of stack to R0
*SP 1 MOV,	move top of stack to R1
0 4 SRL,	shift R0 right 4 places
1 C SLA,	shift R1 left 12 places
1 C SRL,	shift R1 right 12 places
0 30 AI,	
0 39 CI,	
GT IF,	convert R0 to ASCII val
0 7 AI,	
0 7 AI,	
ENDIF,	
1 30 AI,	
1 39 CI,	
GT IF,	convert R1 to ASCII value
1 7 AI,	
ENDIF,	
0 8 SLA,	shift R0 left 8 bits
1 0 A,	add R1 to R0
0 *SP MOV,	move R0 to top of stack
NEXT,	return to calling routine

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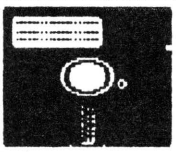

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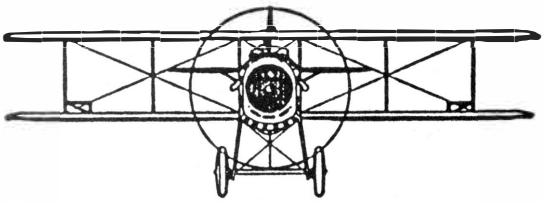

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FORTH—

(Continued from Page 18)

word, which is CONVB. This word is executed 256 times. Since the Forth definition of CONVB executes ASCII twice, the assembler code for ASCII will be incorporated within the code for CONVB. There is no way to link to another procedure from within a machine code routine. The routine in Fig. 4 is the assembler equivalent of CONVB.

The first part of the code puts the top value from the stack into R0 and R1 and shifts the values in these two registers to effectively divide by >10 so that the left nibble of the byte is in R0 and the right nibble is in R1. The next two parts need no explanation other than that each leaves the respective ASCII value of each nibble in the respective register.

The last part shifts the value in R0 eight bits to the left, which is the same as multiplying by >100, adds the value of R1 to R0, writes the value of R0 to the top of the stack and returns to the calling routine.

Substitute this code for the definitions of ASCII and CONVB, then execute. Now there is a noticeable reduction in the delay. There still is a small delay, but it can be lived with. You are barely able to remove your finger from the enter key and the display is there.

This final step in integrating machine code into a Forth program is to load the machine code in directly without having to assemble the code with the assembler screens loaded. An example of what this code looks like is the definition of MON in screen 31. This uses the Forth word "," (comma) which stores the top value on the stack into the next available dictionary cell (16 bits) and advances the dictionary pointer by two. The hexadecimal numbers preceding the comma are the machine code for the word MON. To get these machine code values we have to find the location of the word CONVB and peek at it. Enter the following Forth words and execute in hex:

-FIND CONVB DROP DROP 10 - 50 DUMP

This will dump >50 bytes of memory that will include the code for CONVB. Study the display at the right of the screen. Note the CONV letters. One or two bytes after the end of these letters you will find a word that contains a value similar to >045F. This is the NEXT, instruction. Copy these words down or, knowing the beginning and ending addresses of the code, write a Forth routine to read these values from memory and put them on the stack.

With this information, the following definition of ASCII can be written (this machine code definition is probably more appropriately called ASCII rather than CONVB since ASCII better describes the function of this word; replace the byte on the stack with its ASCII value).

```
CODE ASCII C019 , C059 , 0940 , 0AC1
, 09C1 , 0220 , 0030 ,
   0280 , 0039 , 1501 , 1002 , 0220 , 0007
, 0221 , 0030 ,
   0281 , 0039 , 1501 , 1002 , 0221 , 0007
, 0A80 , A001 ,
   C640 , 045F ,
```

Replace the definition of CONVB and ASCII with this definition and change the CONVB words in HXFER to ASCII. Now the definition of ASCII will be loaded as machine code at compile time and the assembler screens starting at screen 75 will not have to be loaded.

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Improving the TIW CHARA1 file

By LUTZ WINKLER

When Texas Instruments provided the CHARA1 file together with some other enhancements for TI-Writer I was somewhat disappointed. Though it gave us true lowercase characters, it was a poor job — especially when it came to letters with descenders.

TI chose to leave a line spearation equal to two rows of pixels, which leaves only an 8x6 matrix for each character definition. Cut that further by two rows for text mode and now it's only 6x6. Not very much for readable characters.

Though knowing it would be a tedious job, I decided to cut line separation to one pixel (using a monochrome monitor I felt I could get away with it), and defined displayable characters from ASCII 33 to 126 to my liking. At the time I paid no attention to ASCII 0 to 31, the control characters, but did remember to round off the corners of the "O" and also slashed the zero to better be able to tell them apart.

So much for that, I thought, and enjoyhed working with TI-Writer with my larger and very legible characters.

Then there came a day when I received a text file (on disk). I scanned it briefly before sending it to the printer. To my surprise — and as usual, too late — I found it contained control characters which I did not see and which also turned out to be incompatible with my printer. This was not the first time that had happened to me. But, if I could help it, this was going to be the last.

My solution? Make control codes easier to spot by reversing the text/screen colors.

For anyone who has been annoyed by this situation, here is an outline of the procedure. All it takes is a sector editor (John Birdwell's DSKU is my favorite). The characters involved are ASCII 0 through 31, which are all located on the first sector of the CHARA1 file. Well, not quite. The last 12 digits (of the 16-digit string which defines a character) of ASCII 31 are located at the beginning of sector 2. (Do not make these or any other modifications to your original CHARA1 file. Use a backup.) The first six bytes (0 to 5) are the file header and must not be disturbed. But following the file header, the entire CHARA1 file consists of nothing but the 16-digit hex strings defining all ASCIIs from 0 through 127. This takes four sectors. If your file is longer, it can be shortened because after sector four there are only zeroes.

Before I started with the text/screen color reversal, I took care of another matter which had bugged me. With some exceptions

(See Page 24)

SECTOR 1 ORIGINAL CHARA1

```
0000 0800 07FA 0020 0000 1824 2418 0020
0008 1808 081C 0020 0018 2408 103C 0020
0018 2408 2418 0020 0014 141C 0404 0020
001C 1018 0418 0020 0008 1038 2418 0020
001C 0408 1010 0020 0018 2418 2418 0020
0018 241C 0408 2020 3800 1C10 1C10 0040
0020 2038 2438 0070 5070 4854 1C14 0070
4070 001C 1010 0020 0018 243C 2018 0040
0814 101C 1010 0040 4040 1824 2418 0020
2020 2808 0808 0040 4058 2408 103C 0040
4058 2408 2418 0040 4054 141C 0404 0040
405C 1018 0418 0040 4048 1038 2418 0040
405C 0408 1010 0040 4058 2418 2418 0040
4058 241C 0408 0040 4040 1824 3C24 0040
4050 101C 141C 0040 4040 1C10 101C 0040
4444 041C 141C 0070 7070 7070 7070 0040
```

SECTOR 1 VIDEO REVERSE, SOME CHARS REDEFINED

```
0000 0800 07FA FFDF FFFF E7DB DBE7 FFDF
FFF7 E7F7 F7E3 FFDF FFE7 DBF7 EFC3 FFDF
FFE7 DBF7 DBE7 FFBF FFBF AF87 EFEF FFDF
FFE3 EFE7 FBE7 FFDF FFF7 EFC7 DBE7 FFDF
FFE3 FBF7 EFEF FFDF FFE7 DBE7 DBE7 FFDF
FFE7 DBE3 FBF7 DFDF C7FF E3EF E3EF FFBF
FF8F B78F B78F 8FBF 9FA7 AFE7 EFEF FF8F
BF8F FFE3 EFEF FFBF FF87 BF8F BF87 FFBF
FF87 BF8F BFBF FFBF BFBF E7DB DBE7 FFDF
DFDF D7D7 F7F7 FFBF BFA7 DBF7 EFC3 FFBF
BFA7 DBF7 DBE7 FFBF BFAB EBE3 FBFB FFBF
BFA3 EFE7 FBE7 FFBF BFB7 EFC7 DBE7 FFBF
BFA3 FBF7 EFEF FFBF BFA7 DBE7 DBE7 FFBF
BFA7 DBE3 FBF7 BFBF B7AB EBE3 EBFF BFBF
A7AB E7EB E7FF BFBF A3AF EFEF E3FF BFBF
A7AB EBEB E7FF 7070 7070 7070 7000 BFBF
```

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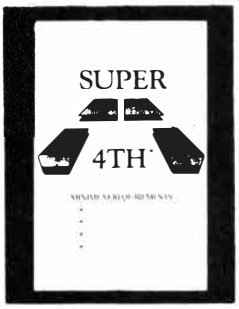

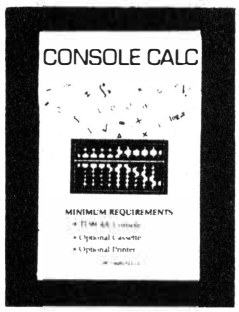

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CHARA1—

Continued from Page 22)

(CR, etc.), when CTRL-U is used to toggle into the so-called "Special Character Mode," the display actually shows the hex value of the selected character. (See page 146 of the TI-Writer manual.) Values from 10 through 15, in hex, are normally indicated by capital letters, i.e. A, B, C, D and F.

Why TI defined them as lowercase in CHARA1 is not quite clear to me. Thus, I redefined them as capital letters. I also did not care for PA, used to indicate a form feed. So, in my file, it is now an FF. Anyone with similar misgivings can do as I did. I suggest doing this before the next step, text/screen reversal, and to be sure that any changes are first written back to the disk.

Assuming all that has been done, it is time to proceed and make those control codes really pop out at you when they are in a file. Reversal of the text and screen colors (also referred to as inverse video) is done by replacing the 16 hex values of the string with its complement. To understand what is happening, let's look at >0 and >F as used in CALL CHAR.

While >F turns all four pixels of a block on, >0 does the opposite, turning all of them off. >1 means that the first three pixels are off, the last pixel is on. >E does exactly the opposite.

Before I embarked on changing the hex values in my CHARA1 file, I drew up a quick reference:

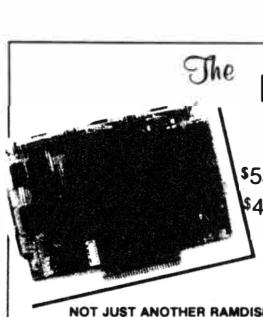
Norm 0 1 2 3 4 5 6 7 8 9 A B C D E F

Inver F E D C B A 9 8 7 6 5 4 3 2 1 0

The upper line (Norm) represents the values shown in the original CHARA1 file. The lower line shows the hex complements. Simply replace the digit shown by the sector editor with the one below it.

For instance, if it shows 0B74, that would translate to F48B. It is that simple, though it is a tedious task. By the way, do not change ASCII 30 (cursor), which is located on the last line of sector one (0070 7070 7070 7070). If you reverse it, you'll get a one pixel wide cursor (vertical line) that is not easy to see.

The procedure I have described does not make the control characters easier to read. There simply are not enough pixels available in text mode for better resolution. However, their presence is much easier to spot and that in itself has been a big help to me.



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Doyle Bynum dies

Doyle Bynum, aged 63, died June 25 in Lancaster, Texas.

His funeral was June 27 in Lancaster.

Bynum was born in Snyder, Texas, in 1923.

With his son Don Bynum, he was co-founder of Softmail and Texas Peripherals.

Don Bynum says his father became interested in computing in 1981, when "I gave him a computer and a Teach Yourself BASIC cassette course for the 4A. Before that the data processing people where he worked had been giving him a hard time, but when he got a few buzzwords, he was more able to get what he needed from them."

The elder Bynum remained active on Texnet on The Source even after their companies were sold in 1985.

"The morning of the day he died he got on The Source," his son says. "I found his printout from when he'd been on that morning. Being on there gave him something to do after his retirement. He was able to make a contribution, and got some recognition for it."

Bynum is survived by his wife, of Lancaster; and one son, Doyle Bynum, and two grandchildren, all of Rockwall, Texas.

Memorial contributions may be made to the Alumni Association of McMurray College in Abilene, Texas.

TAPE has 80-column software

TAPE (Technical Application Product Engineering) announces that TI-Writer and Multiplan are now available for owners of the Mechatronics 80-column card.

The TI-Writer will be sent to users who send in a disk and return postage, while Multiplan is available for $5, according to Franz Wagenbach of TAPE.

He says the TI-Writer runs from Editor/Assembler. The Multiplan requires the Microsoft Multiplan cartridge.

Upgrade of the Mechatronics GRAM-Karte to 512K is available for $165 he says. The upgrade is "piggybacked" on the GRAM-Karte and there is one solder joint to make, which can be customer-installed or "we will do it for them," Wagenbach says.

TAPE also offers the QUICKDISK Drive from Mechatronic, which is a mass storage devise of the TI-74 BASICCALC. Price will be under $200, Wagenbach says. For further information or to order, write TAPE, P.O. Box 4042, Ontario, CA 91761.

Fowler's flagship TIBBS ceases

By LAURA BURNS

The nation's first TIBBS has closed down, but its creator says this is a sign of its success.

Ralph Fowler of Kennesaw, Georgia, near Atlanta, says he shut the board off June 1, after placing a notice that he would do so if calls didn't pick up.

The main feature of the board, he says was downloadable software for the TIBBS, and, he says he would get "two or three calls a week. Most people were mailing in for it and now if people want it I would rather encourage them to get it from their users group."

He notes that for the last six months or so the board has been dedicated to the BBS software.

"The message bases were still there, but they were not being used much," Fowler says.

Also, he notes, the board was down for a while before the June 1 closedown, because of his move to a new home.

"I figure the TI community is getting what they need on a local level," he says. "There's not that much need for a board you have to call long distance. The TIBBS software has been distributed enough that people can get it from their own area."

The year from the latter part of 1985 to the first part of 1986 marked the all-time high for Fowler's TIBBS, he says, with approximately 27,000 calls, "probably 50 percent of them long distance."

Many of the calls, he notes, were "people calling to get the board in a proper way."

After about March 1986, Fowler notes there were "a lot of TIBBS systems around the country. I did not have many programs, games and such to download, just mostly TIBBS-related programs."

Ironically, later in 1986, he says, he put his TIBBS on a PC.

"A hard disk for the TI is still rather expensive, and I couldn't keep the entire TIBBS program online. My job requires me to have a PC online. With the TI I only had two drives. So I had the other online with Xmodem and someone could download in batch format, which is faster—where I didn't have to put different files on at different times. That TIBBS program takes three single-sided disks," Fowler explains. "People would call me and I would put them on one at a time. This way (with the board on a PC), someone could call in on PC Pursuit in the middle of the night."

Fowler says he has been building a house since July 1986 and this has "slowed me down on the computer."

He adds, "I never did run the board for people in Atlanta. There are about 160 other boards in Atlanta and I think two of them are TIBBS. Lots of people now are not willing to call long distance for what they can get locally. I wouldn't myself. Unless there was something out there I really wanted I wouldn't make a long-distance call. Why should someone make a long distance call when they can get it locally? The boards are out there and people can modify them any way they want as long as they leave my name on."

Fowler adds, "It would be nice if some of those people who got the systems would send some earnest money. I wasn't having any problems selling the program through commercial channels before I made it fairware. But since Fast-Term was made fairware, I thought that a BBS should be, too."

He mused, "As soon as I get settled in here, I might put it back on line. I wonder if I did if anyone would call?"

National group aids clergy TI users

By LAURA BURNS

Most TI users groups in this country, even if they have members outside their area, are geographical in scope.

That is, they'll be identified by a city or town name, or sometimes an area name or nickname (the Central Texas Users Group, the Nutmeg 99ers in Connecticut), and that's where the action is for the group.

Not so the Pastors User Group, headquartered in Plainview, Texas. The group is unique in that it is keyed to an occupation.

At the time the group was founded, in August 1986, according to the Rev. Steve Venable, "I was pastor of two small churches in west Texas and I was using my TIs left and right. I earned a degree in computer programming before I went into the ministry. There was another United Methodist pastor in Spur and he didn't do anything with his TI, but I was introducing him to things on it and wrote a few programs for him. He told me about a pastor in Amarillo who had a TI and could use some help, and I thought, 'This is ridiculous.' So we just decided to form a club."

The group has grown to about 25 members, Venable says, with members from all areas in the United States, one from Canada and one from England. Geographically, the largest membership contingents are from Texas and Georgia, with "six or seven members" for each of those two states. "I can understand Texas, but I don't understand Georgia."

He describes the membership as "ecumenical"; about one-third Methodist, one-third Baptist, and the rest as pastors from other denominations or of non-denominational churches.

"We don't do any theological stuff in our newsletter," adds Venable, who is now associate pastor at the First United Methodist Church in Plainview. "We try not to step on anybody's toes or hurt anybody's feelings."

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Quality 99 to take American Express cards, offers catalog to TI99/4A users

Quality 99 Software of Washington, DC, has been authorized to accept American Express credit cards, according to Quality 99 president Larry Hughes.

Quality 99 also accepts Visa and Mastercard, Hughes said.

For a free Catalog #23J of disk programs, users may call or write Quality 99 Software, 1884 Columbia Rd. #1021, Washington, DC 20009, (202) 667-3574.

More TI users groups

The following are additions and updates to our user group listings, which we began publishing in the May 1987 issue.

Colorado

Pueblo 99eer Users Group, 809 E. 12th, Pueblo, CO 81001. Stanley Clark, president, (303) 544-2504. Meets at 7 p.m. second and fourth Fridays at Computer Palace, 10th and West, Pueblo. Founded 1982. Annual dues $12.

Florida

Brandon TI Users Group. Gary Sweers, president, (813) 681-8954. Meets first Tuesday of the month in Room 360, Brandon High School. Library, newsletter, three BBSs. Club projects have included building 16K SuperCarts and Horizon RAMdisks.

Suncoast 99er TI Users Group, 8421 Westridge Dr., Tampa, FL 33615 (address correction). Bob Haines, president, (813) 971-9681. Meets second Thursday of the month at the Salvation Army, 3800 Ninth Ave. N., St. Petersburg, Florida. Newsletter, library.

Tampa Group. Contact Brenda Burwell, (813) 882-5942. Six members. Meets second Monday of each month at the North Boulevard Rec Center.

Upper Pinellas 99er Group, Ed Boyd, president, (813) 736-1616. Newsletter, library. BBS operates September-May. Meets third Monday of each month at the Largo Public Library, Largo, Florida.

Kentucky

Kentucky 99/4A Computer Society, P.O. Box 36246, Louisville, KY 40233-6246. Dallas Phillips, president, (502) 845-7567 (home). Approximately 80 members. Meets third Sunday of month at Indiana University Southeast, 4201 Grant Line Rd., New Albany, Indiana. Founded October 1981. Annual dues $15.

Massachusetts

Boston Computer Society, One Center Plaza, Boston, MA 02108. Meets third Wednesday of month at Room 659, Massachusetts College of Art.

Magnetic TI Users Group, 38 Walnut Pl., Dedham, MA 02026 (address correction). Annual dues $20, not $12 as previously listed.

Pioneer Valley 99/4A Users Group, 111 Oakridge St., Chicopee, MA 01020. Phone: (413) 593-6951 or (413) 532-0724. Meets second Wednesday of the month at one of five meeting places. SIGs meet on a need-to basis. Newsletter, 50+ disk and tape newsletter, 24-hour BBS at (413) 736-0667.
sletter libraries. Founded June 1984. Annual dues $10 individual, $15 family.

North Carolina

Guilford 99er User Group, 3202 Canterbury Dr., Greensboro, NC 27408 (new address).

North Dakota

Minnesota and Dakota Home Users Group (MADHUG). 509 Reeves Dr., Grand Forks, ND 58201. Contact: Dennis Schjeldahl, newsletter editor, (701) 772-6180. Meets at 7 p.m. second Tuesday of each month at Grand Forks Public Library. SIG meets at 7 p.m. on the fourth Tuesday in the Electronics Room of the Grand Forks Public Library, where the group's computer is located. This and the group's library of tapes, disks, newsletters and magazines are availaable during library hours. Founded May 1983. Annual dues $12.

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BE A WINNER: JOIN THE CHICAGO-AREA TI-99/4A USERS' GROUP NOW!

The Chicago-Area TI-99/4A Users' Group is now offering a special package deal for new members who are unable to regularly attend meetings. For the initial fee of $21.00, you will benefit from the following services:

SAMPLE DISK OR CASSETTE: You will receive a double-sided (FLIPPY) single-density diskette or a tape cassette (please specify when applying) which contains a sampling of the software available in our group's program library.

LIBRARY: The club maintains a library of programs available to all members for a minimal charge. You will also receive our free catalog, so that you may order programs through the mail.

NEWSLETTER: Members receive 10 monthly editions of the club newsletter, *The Chicago Times.* A larger *Super Summer Issue* is published for the summer months.

BULLETIN BOARD SYSTEM: The club maintains the very first TI-99/4A computer bulletin board system, operational 24 hours a day. As a non-attending member, you will receive a free password giving you lifetime access to the private sections of the board.

MEMBERSHIP: New members are most welcome and are usually swamped with offers of assistance and advice from fellow members. The six-year-old group has over 400 active members and is growing every year. If you do not live in the Chicago area and are unable to attend the meetings, you will receive the newsletter by mail. You will also receive any information on discounts that the group receives.

THE TI-FAIRE: The Chicago TI-Faire, held every year at Triton Junior College, is the biggest all-TI gathering in the U.S.

CHICAGO TI-99/4A USERS' GROUP APPLICATION FOR MEMBERSHIP

Date _____ **Phone#(___)** _____
Name _____
Address _____
City, State & Zip _____

★ ★

Membership: $21/1st Year-$24/Overseas-
SEND PAYMENT TO:
Chicago-Area TI-99/4A Users' Group, Inc.
Don Jones (Membership Chairman)—Dept. M7
P.O. Box 578341 Chicago, Illinois 60657

Allow 6-8 weeks for delivery

USERS GROUPS—

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Ohio

Cin-Day User Group, 416 Pinewood Ave., Piqua, OH 45356 (new address).
Penn Ohio Users Group, 71 Elm St., Struthers, OH 44471. 24-hour BBS.

Oregon

Eugene 99/4A Users Group, P.O. Box 11313, Eugene, OR 97440. Laurel Crenshaw, president, (503) 998-8590. Meets 8:30-11:30 a.m. second Saturday of month at Eugene Water and Electric Board Cafeteria, 400 E. 4th. MUG users meeting at 6:30 p.m. the Monday following (phone president for location). Newsletter. Disk and user group exchange newsletter libraries. Group purchasing. Annual dues $18 in March, prorated for new members.

Utah

Ogden TI99/4A User Group, 1005 S. 100 W., Clearfield UT 84015. Phone: (801) 773-2552. Supporting TI99/4A, Geneve 9640.

Washington

Tacoma 99ers, P.O. Box 48283, Tacoma, WA 98442. Vern Schrotenboer, president, (206) 848-6872. Meets twice a month, year round. Newsletter.

FCC proposes ruling on data transmission services

A proposal before the Federal Communications Commission would provide that companies offering online data transmission services through local telephone loops should have to pay access fees to hook up to the phone networks.

Currently, packet-switching networks, data base and online services and services that offer protocol conversion are defined as "enhanced services," not subject to regulation. The proposal would redefine them as "basic services," according to an article by Brock N. Meeks in the March 1987 *Microtimes.*

Michael Scharge, writing in the *Washington Post,* has suggested that these access fees could run as high as $5 an hour per user for data communications services such as CompuServe, The Source, Telenet and Tymnet. Meeks says that GTE's PC Pursuit, which uses modems at both ends of its connections, could see an additional $8 or $9 charge per hour.

Currently telephone services such as MCI, Clay-Desta and Sprint pay a similar fee for their hookups. Scharge notes, however, that data transmissions take up far less space than voice transmission on a phone line. Bandwidth for one voice transmission would be adequate for 12 data transmissions, he notes.

He cites Bill Von Meister, founder of The Source and Quantum Link, as suggesting a per-line or per-bit basis for any charge, rather than a per-user or per-time charge.

Pushing for passage of the fee proposal, called Computer Inquiry III, are the Bell Operating Companies and AT&T, according Meeks.

Scharge notes that the FCC proposal would provide for exemption of private data networks, such as those operated by the Ford Motor Company and Boeing.

PASTORS' USERS GROUP—

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A few non-clergy also belong to the group, he says.

"We've had several who weren't ministers who called up or wrote and said, 'My pastor has a TI,' or 'I have a TI and my pastor relies on me for computing,' " he says. "Not many—our group has about three or four of those kinds of guys."

Venable says that "since we can't get together and have a meeting" he feels responsible for passing on any information passed on to him by members in the group's newsletter the LOGOI, which, he explains, is a Greek word meaning forum or discussion. "We use it as a forum for passing on information."

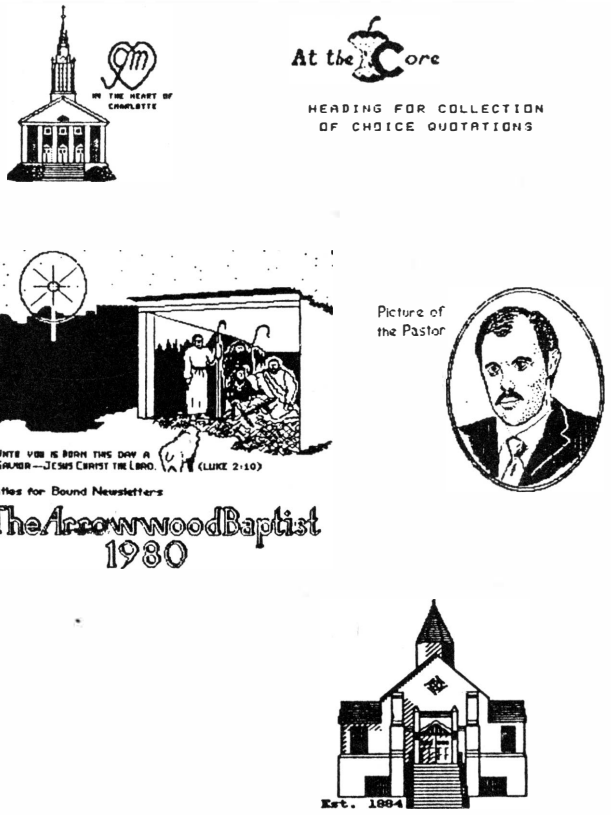
And, even though the information is not theological in nature, it is occupationally specific, he notes. Programs have included a sermon illustration file and a membership tracking program. "This can help you keep track of how active church members are and in which activities," he notes.

For further information, write the Pastor's User Group, c/o Steve Venable, 1015 W. 7th, Plainview, TX 79072.

BBS moves south

The Pro-99er BBS has moved from Massachusetts to Florida, according to sysop Gary Blydenburgh.

New telephone number for the board is (305) 951-7681. The board operates 24 hours at 300/1200 baud with X-Modem downloads. The board also sells the Myarc product line, he says.



From the LOGOI, ideas on using graphics programs in church newsletters

Junkman Junior

Another 'classic' game module

By RAY KAZMER

Think back to the days when your first 99/4A arrived. If you are a typical 99'er, you also bought a pair of TI joysticks and a Munch Man module. Remember the joystick cramps that soon followed? Well, prepare to re-live those exciting days of yesteryear, video-game fans, because Junkman Junior, your next high-speed thriller, is here!

Long ago, I lost my *compu-phobia* (an unnatural fear of "hurting" my computer, by pressing a "wrong key") so when I slid Junkman Junior into my module port, I ignored the documentation and just let 'er rip! Wrong. You must read the docs, even though they are lacking many important facts.

The docs were written by Stephan Meyers, who also wrote the "module version" of the game, and W.R. Moseid, president of DataBioTics. These docs are quite unlike any you've seen from TI. Starting with a tongue-in-cheek history of what's been going on in Burrwyn, USA, in 2087, we learn Junkman Junior's real identity, a little about his prior job and even what happened to his dog, Tinker, who, due to an unfortunate mishap, does not appear in this game. In short, the docs are entertaining, but not overly informative about the operation of the game. The humor earned the "B" I gave it on the report card. No points were deducted for the typographical errors, but I do have a few more N.B.T. complaints.

What's N.B.T.? All 11 game levels have been given titles and show up at the bottom of the playing screen (a nice touch) just before you begin the action. The title of level one is "No Big Thing." You will eventually memorize all of the titles. The reason I mentioned it now is because my next complaints are also N.B.T., but worth a look.

One item which should have been in the docs, is the fact that this game has no pause feature. If it does, I certainly couldn't find it. This means, you must play the game, from go to whoa, with only a brief musical respite between levels (barely enough time to relax my claw-like grip on the joystick.) But that's how it's played. If I had known it had no pause at the outset, I would've probably saved lots of J.J.s.

Another docs boo-boo is that they neglected to say that you'll get a new J.J. when (if) you reach 7500 points. Sure, it's N.B.T., but when do I get my next replacement, if any. Knowing a replacement is ready in the wings gives me more incentive. It should have been mentioned.

Also N.B.T. is that the scoring is not thoroughly explained. After exhausting myself on one level, I would take a quick count of the score and remaining bonus, which is added, then becomes the score on the next level. But the next level's score was always higher than it should've been. Why? Was this a bug? No, the reason I was confused is because the docs don't mention that a second bonus was being awarded.

The ignored bonus works like this: In addition to "bonus," you get 25 points per remaining man, multiplied by the level number. In Extended BASIC, it looks like this:
((MEN*25)*LEVEL)(BONUSSCORE)
NEXT LEVEL'S SCORE.

It should have also been explained that the displayed bonus counts down at a steady pace, no matter what difficulty (read "speed") level you selected to start the game. This means, that if you select a lower difficulty (1-4) at the start, you'll never get a bonus, even if you do maneuver all game levels perfectly. Difficulty selections range from 1 (super slow motion) to 9 (approaching light-speed). If you wish to win a bonus, you must play at difficulty 5, or higher. You should start low (4-5) and work your way up, when your usual difficulty level gets too easy.

Only one thing is worse than sparse information in docs, and that is erroneous in-

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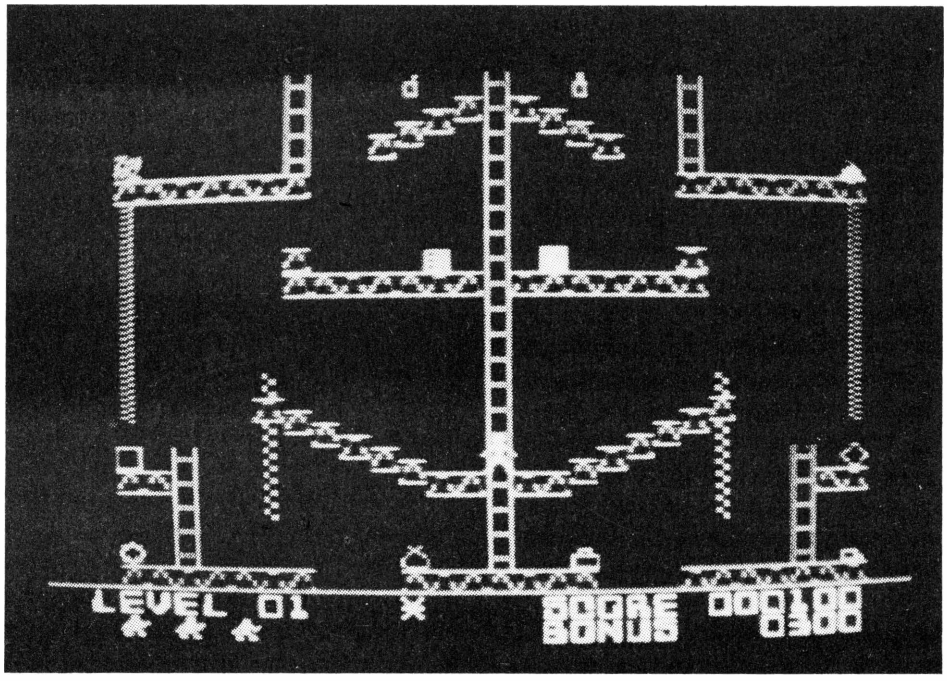
Review

Report Card

Performance ..... **A**
Ease of Use ..... **A**
Documentation ..... **B**
Value ..... **A**
Final Grade ..... **A**

Cost: $16.95
Manufacturer: DataBioTics Inc., P.O. Box 1194, Palos Verdes Estates, CA 90274
Requirements: Console, joystick



JUNKMAN—

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formation. In the sixth paragraph in the manual, in which the difficulty selection is described, the 1 and the 9 were swapped around. Can you imagine my surprise, if I had read the docs first, then selected a difficulty level of 9, thinking that was the slowest setting?

One last major item was overlooked — how to abort a bad game. While maniacally punching every key in a futile effort to find a pause function to save my last J.J. from an onslaught of vicious little marauders known as "MicroDogs" (more about them later), I hit a FCTN-5. Poof! The ropes, girders, ladders, everything vanished. It was all replaced by a single word "Difficulty" on a black screen. I was suddenly back to the start of a new game. What a lousy way to make a discovery.

Through trial and error, I found that pressing only the 5 key would also zip me back to the start of a game. However, if I pressed it for more than just a split second, the game would restart at Level 5. Holding down FCTN-5, however, returns you to the start without a hitch. Now I could experiment, or dump a game in which I had lost my first J.J. too quickly, without having to turn the console off, which also deleted the high score. If you experiment the way I did, you'll definitely use this feature, so make a note of it. You won't find a mention of it in the documentation.

Now, the good part, the game itself. It was written by Steve Mildon, who also gave us Advanced Diagnostics. After seeing both programs, I'm a confirmed Steve Mildon fan. Bravo! I want to see more.

Until Junkman Junior came along, I always felt it was okay to base a final grade on an average of all the combined grades. But since Mildon did such a first class job of programming, I feel it would be unfair to him, to include my lower grade for the docs. After all, docs are not what we're paying for.

Other games which are similar to Junkman Junior include TI-Runner, Midnite Mason, Donkey Kong, Burgertime and, perhaps, Popeye.

Although Junkman Junior is a "girders and ladders" game, as are all of the others, that's where the similarity ends. I mention this merely to give you an idea of how this game works. In other regards, Junkman Junior is unique.

The module is the same size and shape as a standard TI module, but it lacks an automatic reset. In other words, to load this game you must first turn your console off (if it's on) then insert the module. As Junkman Junior's title screen appears, we get a brief musical greeting, then see a glimpse of each of the 11 screens. For less able joystick-yankers, this may be the only time they'll see all the levels.

We meet the MicroDogs on the first level. The docs are accurate in describing these malevolent little beasties, which are no bigger than a period. In fact, that's exactly what they are. We are told we'll "hear a noise like a tiny bark" just before they attack. It sounds more like a gunshot to me.

MicroDogs usually float slowly onto the screen from the top, bottom or sides. When they align with J.J., pow, they suddenly zip straight at him. Sometimes, you don't even see them until after you hear the pow. Still, they're not as dangerous as they sound and you can elude them, with practice. Their greatest threat to J.J. is that they are very distracting and can easily make you zig, when you should zag.

As the game level increases, the MicroDogs' aim improves. On Level 5 there are two of the varmints after J.J. They also have a nerve-racking habit: They don't always attack. If they did, you'd know what to expect. Ever so often they just float by, ignoring J.J. While he (you) stands there ready to dodge them, your bonus shrinks away.

Now, here's the bad news. Once you get good enough to reach Level 7 two of the little demons still come floating onto your screen, but when you hear that pow...ugh, it's just too awful to describe. (But here's a clue: Level 7 is named Criss-Cross. It should've been named "Zig-Zag.")

One of the novel things in Junkman Junior is what happens when you lose a man, either by a hit from a MicroDog, contacting another of many hazards or, more usually, one of your own errors. Poor J.J. goes tumbling all the way to the bottom of the screen. He bounces off every obstacle on the way (ladders, girders) and flops, legs akimbo, with a circle of tiny "stars" dancing around his head. All this occurs to the tune of a jazzy rendition of the familiar funeral dirge plays. Though you lost a man, you get the impression that he wasn't really "killed," only badly dented. When he's replaced, it's as if the battered J.J. has gone off for repairs so he can try again in the next game. This must be seen to be believed.

True to his image as a hero, J.J. even picks up junk after he's taken a spill and is tumbling and bouncing off girders. And, if he's lucky, he will fall onto the last remaining piece of junk on a level, which saves his neck. You would then move to the next level without losing a man.

But I'm getting ahead of myself. Why is Junkman Junior asking for our help? Because we must assist him in trying to save the world, of course. (Would anything less be worth such an effort?) Some nasty sounding aliens have zapped most of Earth's population into mindless, suicidal litterbugs. We must get all this junk picked up or face awful consequences.

There's actually two ways to play this game: For score and for planning. Though most levels share the same basics (girders, ladders, ropes) the patterns change and a new hazard is pitted against you on each level. As a result, this is not merely a "white-knuckle" game. You must also understand and learn each level. Being able to pick various difficulty settings is the key. If you're running J.J. at your own maximum speed and find that he's always getting bumped off at the same spot, you should down-shift and restart at a lower difficulty level. Once you've figured out what you are doing wrong at that spot, you can shift back to the higher level. If you intend to win this game, you'll use this technique.

Is Junkman Junior the "perfect" game? Well, no. I have a couple of minor complaints, but nothing drastic enough to lower its final grade. I did lower the "Ease of Use" grade to *just* an "A" for the following reason: Level 2 seems way too hard to be seen so early. By comparison, Level 3 is a snap. It is rare when I can get past Level 2 without losing at least one man. (You start with a total of four J.J.s).

Next, the attrition rate on J.J.s is so high, even when played at a lower difficul-

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Avatex 1200/1200hc Modem

Price makes this one right

By J.P. GALLAGHER

Have you gone to using 1200 baud yet? Ah, you thought of it but $250 to $300 is too much for the budget. If $99.95 to $119.95 sounds better, then read on.

There is a company in Sunnyvale, CA, that doesn't believe that good has to be expensive. They go by the name E+E Data Comm. One of the items they market is a little gem called the Avatex modem. This article is devoted to how to make this not-designed-for-the-TI99/4A modem work like a horse for you. In fact E+E Data Comm doesn't even make a cable for the TI.

The first step is to "shop" around the many mags and periodicals for the best price. (Apparently E+E Data Comm hasn't discovered the resource that this fine magazine [MICROpendium] caters to.) The price can range from a discounted $99.95 from large mail-order companies to $149 from those firms that have you pay for the name of the place you ordered it from. I have even seen the Avatex 1200 advertised for $89.95. So be sure you are "time wise and not penny foolish" when buying.

Once you have decided where to purchase the modem you have a choice of two models, the Avatex 1200 or the Avatex 1200hc. What's the difference? About $10-$20 and a few more goodies. The Avatex 1200 is about 80 percent Hayes compatible (which will accommodate most emulator programs or BBSes). The Avatex 1200hc is 100 percent Hayes compatible. The Avatex 1200 is warranted against any manufacturer defects for one year, while the 1200hc is warranted for two years. Unless you plan on using the modem for a contact sport, either one should last longer than a visit from your relatives. Also, the 1200hc has its very own speaker.

What do you get for your hard-earned dollars?

1) A direct connect modem that operates at 300 or 1200 baud (give the Mickey Mouse Eared modem back to Mickey).
2) A three "push" button control panel; one for on/off, one for forcing 300 or 1200 baud and one to switch from "voice to data" connection.
3) To the left of the push button are eight (count 'em, eight) LEDs. From left to right they are "RI," lets you know when someone's calling or transmitting or when you are dialing out; "TM," test mode, yep, this little gem will trouble-shoot itself whenever you tell it; "MC," modem check, continuously checks the modem's operation when on and not in use and goes off during data transmission; "RD," receive data, flickers whenever the modem receives data, which at 1200 baud it "blinks" pretty fast; "SD," you guessed it, comes on whenever your modem sends data; "TR," terminal ready, comes on whenever you "power up" the modem and signals that the signal (DTR) is operational; last but not least is the "POWER" LED—you're right again, it means you turned the modem on.
4) Now for a feature that has mixed blessings. On the back of the modem you have the standard "phone/jack," RS232 (female) port and the AC adaptor socket (adaptor included) plus a series of DIP switches. The DIP switches allow the user "manual" control over some very important functions that are used for the average telecommunication application. The user manual included with both modem models gives you the factor settings and even explains why.

Review

Report Card

Performance ..... **A+**
Ease of use ..... **B−**
Documentation ..... **A−**
Value ..... **A+**
Final Grade ..... **A**

Cost: $99.95 to $119.95
Manufacturer: E & E Data Comm, 1230 Oakmead Pkwy., Suite 310, Sunnyvale, CA 94086
Requirements: Console, TV or monitor, terminal emulator program, RS232 interface, telephone.

The mixed blessings begin with the fact that you will have to ignore the factory settings and change the switches to accommodate the TI and most of the software written for telecommunications. The following settings work with MASS Transfer 4.0 or higher, 4a/Talk, Fast-Term and TEIII.

Switch #1 - up (Data Terminal Ready, line signal detect)
#2 - up (Modem messages displayed in words)
#3 - down (Modem messages displayed on screen)
#4 - up (Modem Commands displayed)
#5 - up (Enable Auto Answer)
#6 - up (Carrier Detect, line signal activated)
#7 - up (Clear To Send, line signal activated)
#8 - down (Modem commands recognized)

You can "play" with any combination you want to suit your tastes, but the above work the best for most BBS programs as well.

OK, now that we've tackled the option switch (DIP) situation, let's venture on to the cable. First of all, the modem does not come with a cable. This is OK for TIers because we gotta make our own anyway. In fact, all the companies I talked to do not stock a TI-compatible cable.

If you have a "knack" for wiring or have mastered the upside-down and backwards world of the RS232 jumper box, you will have no problem making a working patch cable. If you are not versed in the aforementioned, take this article to a friend and/or technician who is.

There are at least two ways you can make a patch cable. The first is by buying two (male), 25-pin RS232 connectors (that's what I said, two male connectors, because both the TI-RS232 and the Avatex 1200/1200hc have female ports); a couple of metal shields for the connectors (metal is better than plastic, as metal reduces RF interference); and some resin core solder, soldering implement and at least two feet of multistrand wire (at least

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Bubble Plane

Getting up with the chickens

By BRYCE WILCOX

When I first sat down to this game at the 1987 Computer Faire in Denver, Colorado (sponsored by the Rocky Mountain 99ers), I wasn't the least bit disappointed.

The performance of this new game was quite good and the eye-pleasing "Bubble Plane" graphics kept my eyes riveted to the screen.

Later, as I read the manual and had a chance to talk with the creator, I learned that "Bubble Plane" is 100 percent assembly language, runs from XBASIC, and costs only $9. It was looking better and better!

(Wilcox evidently received a sale price. The manufacturer says the game retails for $15.—Ed.)

The graphics are, for the most part, typical 8x8 sprites and average 1 or 2 char trees, men and chickens ("CHICKENS?" you say? I'll get back to that later.) There are two exceptions to this standard:

First, the left-to-right (or right-to-left) scrolling is *extremely* jerky, and the plane jerks with the rest of the screen! This is quite disconcerting, and though I was soon able to ignore it I hope future versions of Bubble Plane will not suffer from the same problem!

Second, the "Bubble Plane" itself, a small soap-bubble sprite, can point its rounded nose in 16 directions! This was really fun to watch, and several times during the game I stopped to see the cute-looking crusader do loops and twirls on the screen in response to my joystick!

One of the many interesting things about this program is the fact that the author (who lives in Colorado Springs and founded Gadego) saw fit to add several strange features with such bizarre names and purposes as "Fudge," which is what happens if the enemy soldier parachutes onto the wrong surface and disintegrates! One such phenomenon is "Chickens" (I told you I'd get back to it). As your acrobatic aircraft loops over barns and dodges clouds, he will encounter a *chicken* sitting on a factory roof or standing on a house's chimney! Although the author asked me not to reveal the exact purpose of "chickens," I can assure you that the logic (or lack thereof) in the creation of these funny fowls is rare in computer games and well worth seeing in action.

Review

Report Card

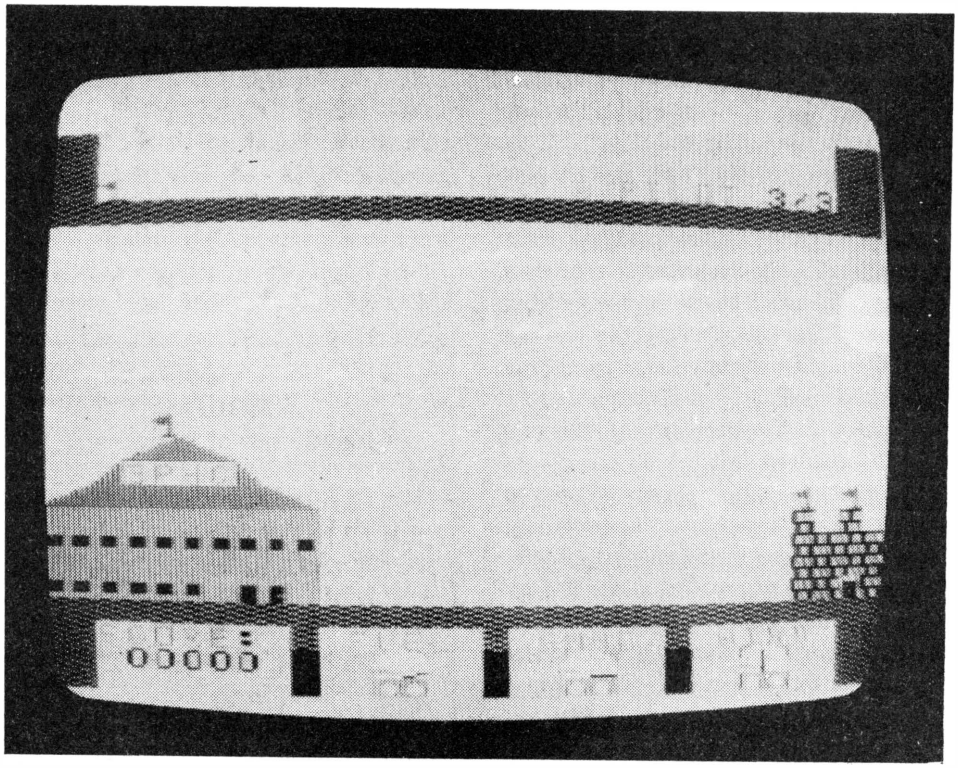
Performance ..... A–
Ease of use ..... A
Documentation ..... A
Value ..... A
Final Grade ..... A–

Cost: $15
Manufacturer: Gadego Software, 6305 Rabbit Ears Circle, Colorado Springs, CO 80919.
Requirements: TI compatible computer, TV or monitor, disk system, 32K RAM, Extended BASIC.

The purpose of this game is to defend Bubblonia from the evil "Grunslandian Jets," which fire missiles at the good guys. As your Bubble Plane flies over the peaceful Bubblonian landscape, a brief "Buzz" is heard and a Grundslandian Jet arrives on the scene. On the earlier levels all you must do is stay above or below the Jets and you are safe, but, as you get further along, the Jets fire *guided* missiles! There are a couple of ways provided in the booklet to escape these, but the player will soon discover his own additional ones, necessity being the mother of invention!

Overall, I would recommend this game to anyone who enjoys a good romp through Wonderland *or* to anyone who likes an aerial dogfight, coupled with the challenge of a series of mazes as well as the challenges of bombs and bad guys!

According to the manufacturer, a cassette version of the game will be issued at a later date.—Ed.



JUNKMAN JR.—

(Continued from Page 29)

ty setting, that getting a replacement J.J. at 7500 points is not enough Many of my bouts ended so fast that I hardly knew what hit me. A replacement at after every 5000 points would be far less frustrating.

When the game ends, all graphics scroll rapidly down through the bottom of the picture (an unusual effect). I had no doubt that the game had ended. Suddenly, the screen is full of horizontal bars of wildly flashing colors, probably indicating that those nasty aliens have beaten Earth. Since the game screens have titles, this one should also have one. I'll name it "Eyeball Shocker."

This game responds to commands faster than you'd believe. I've used a variety of joysticks with it (with mixed results.) One factor is the "throw" of a joystick (how far the stick moves, before making a contact), which eliminated my old TI sticks.

I also own a well-used Pro-Stick II — one fire-button broken and the other embedded in its innards — which gave surprisingly good results. After pulling it apart and cleaning the remnants of its contacts, it even worked a little better.

The third stick I tried was purchased for practically nothing at a swap meet and wasn't intended for use with a TI. After fixing the wires it worked, but as I made a particularly desperate leap I yanked the shaft clean out of the unit. Needless to say, my J.J. wasn't around for very long after that, and neither was my el cheapo joystick.

I tried my last stick, my newest purchase, which shall remain nameless (but it fits your hand and has switches inside which go clickety-clack when its red shaft moves.) This stick has no way to lock out diagonals. Strangely enough, that was not a problem. Hitting only the verticals and horizontals is an art, which requires very little practice. The problem with this unit is that the micro-switches do not always let go when the shaft is released. When you expect J.J. to stop, he just keeps going, scampering right off the ends of girders. I had the reverse problem with the fire-button, which occasionally requires the strength of Hercules to push it. This causes J.J. to jump late or not at all, which always ends in disaster. The sticking switches may only be inherent in my unit, but I have a hunch that it is more wide-spread. This stick will jam, when the shaft is jerked too hard, to one side. It also jams with Munch Man. Joysticks represent the link between any game and the player. In this case, it's a weak link.

So, what stick do I recommend for use with this game? Any stick which works flawlessly. (I haven't found one, yet.) From now on, Junkman Junior is *the* game on which I'll test any new joysticks.

There you have it, video-game fans. If you haven't already bought a Junkman Junior, you'd better do it soon. Your module collection is incomplete without it.

But one word of warning: Junkman Junior is addictive. It is also the newest classic. I can hardly wait for the movie to come out.

AVATEX MODEM—

(Continued from Page 30)

seven strands). If you can't find any wire, standard telephone wire (four strands) will work doubled up just fine.

The second way (the one I prefer) is to purchase a two to ?? foot length of standard (male to male) connector installed wired straight through to all 25 pins. Then purchase a standard (male to female) connector "jumper-box" for the RS232, some resin core solder and a soldering implement. You will have to be extremely careful of what side of the jumper-box you wire to be the modem and what side is to represent the RS232. I strongly encourage you mark at least one side of the jumper-box bread board connectors to indicate which is the modem pin-out and/or which is the RS232 pin-out. If they are switched around, i.e., you plug the jumper-box into the modem port, connect the pre-wired cable and connect the pre-wired cable to the RS232 port, the modem will just sit there or start doing some strange things. The correct method is: Plug the finished "jumper-box" into the RS232 port first, connect the cable to the modem port. Once you have all the cables, etc., connected, be sure you "tighten/fasten" them to the modem, themselves and the RS232. All too often transfer problems can be traced back to an improperly secured cable.

(The B- grade for "ease of use" is only because the user has to build the cable.)

CAUTION: When using the jumper-box method pay close attention to where the pin numbers are on the bread board. When making a cable from scratch, don't mix the ends up as they are both male connectors.

Another thing I like about the jumper-box is you can insert your wires and test your configuration first before soldering.

Once you have checked all final connections (recommend the use of an Ohm meter), you are ready to connect the finished product in the manner previously described. There you have it. Now you can enjoy this rather sophisticated piece of hardware at a total of around $140. Since most modems of this caliber for or orphan cost more, coupled with the fact that you still have to buy a TI configured modem cable, you've got a great deal.

If I had to say something negative about the Avatex 1200/1200hc it would be in the way the user manual requires you to bounce back and forth between sections to acquire all the neat information you received in this article. The manual is 72 pages long and goes into some pretty seri-

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Correct pin-out connections

	MODEM (female side of jumper-box) OR (either male connector for when building the cable from scratch)	RS232 (male side of jumper-box) OR
PIN #	1 - (Protective Ground)	1 - (Protective Ground)
	2 - (Transmitted Data)	3 - (Received Data)
	3 - (Received Data)	2 - (Transmitted Data)
	6 - (Data Set Ready)	20 - (Data Terminal Ready)
	7 - (Logical/Signal Ground)	7 - (Logical/Signal Ground)
	8 - (Carrier Detect)	19 - (Terminal Ready RS232/2)
	20 - (Data Terminal Ready	6 - (Data Set Ready)

Newsbytes

Seattle schedules second TI event

The second annual TI Faire in Seattle, sponsored by seven Washington State users groups, is scheduled for Sept. 26 at the Sea-Tac Holiday Inn.

Among those scheduled for the Faire, according to Barbara Wiederhold, one of the organizers, are Franz Wagenbach of TAPE, Jack Riley and Lou Phillips of Mechatronics, Jim Horn of the CompuServe TI Forum, Chris Bobbitt of Asgard Software, Scott Darling, TI sysop on GEnie, and a representative from Millers Communications of Seattle, producer of Videofile, a video titles program for the Myarc 9640, scheduled for release at a later date.

Wiederhold said her store, the Queen Anne Computer Shoppe, will be represented as will Bits and Chips, another Seattle TI dealer.

She says that "a couple of spaces" remain for interested vendors. Last year's event attracted 800 persons, Wiederhold noted.

The Faire will take place from 10 a.m. to 6 p.m., with a "fun night" scheduled for that evening, she says. A hospitality suite will be open the night before, she says.

For further information, contact Chuck Wynne, president of the Puget Sound 99ers, at (206) 745-3249 or Wiederhold at the Queene Anne Computer Shoppe, 6102 Roosevelt Way N.E., Seattle WA 98114 or (206)522-6558.

Advance Australia Faire notice

The TI Brisbane Users Group will sponsor a Faire in May 1988, according to Garry J. Christensen, coordinator.

The Faire is being scheduled to coincide with Expo '88 in Brisbane, Queensland, Australia.

Christensen say both commerical vendors and many users groups in Australia will be represented. He says that products by Australian computer engineers, including RAMdisks, mini-expansion systems and three-slot expansion boxes, will be displayed.

For further information, contact Christensen at 36 Henzell St., Kippa-Ring 4020, Qld. Australia or 07-284-1841.

Wisconsin Faire set for Nov. 8

The Wisconsin 99er Computer Council and the Milwaukee Area User Group announce their fourth annual TI Computer Faire from 9 a.m. to 4 p.m. Nov. 8 at the Airport Holiday Inn, 5311 So. Howell Ave., Oak Creek, Wisconsin.

The fair is being held as the second part of a TI Weekend which begins with the Chicago TI Computer Faire Nov. 7 at Triton College.

Booths are available to vendors on a first-come, first served basis at $35 for the primary booth and $25 for each secondary booth, according to Gene Hitz, Faire coordinator. Booths will consist of a 64-square-foot area with an eight-foot table and several chairs. Electricity will be provided if necessary, he says, but vendors should bring their own cables and cords. The Quality Inn is offering special room rates to participating vendors of $38.75 single occupancy and $45 double occupancy.

Seminars, speakers, product demonstratins and door prizes will be featured, Hitz says. Admission to the Faire is $2.

For further information contact Hitz at 4122 Glenway, Wauwatosa, WI 53222 or (414) 535-0133.

DIJIT introduces AVPC in Los Angeles

DIJIT Systems of San Diego, California, introduced its latest product, the Advanced Video Processor Card, at the 99/FEST-WEST/87 in Los Angeles.

According to the manufacturer, the AVPC fits into the Peripheral Expansion Box and is compatible with existing TI99/4A software. It features 80-column text and advanced graphics with up to 512 colors, the manufacturer says. The AVPC also supports Mouse and Light Pen inputs.

The DIJIT Systems card contains 192K of video RAM and is designed to work with the "DIJIT-EYEzer," and external Gen-lock and video digitizing accessory. According to the manufacturer, it will allow titling and graphic overlays on home video as well as computer manipulation of external video images, giving the TI99/4A video processing power comparable with the Atari ST and the Amiga.

The product is scheduled for release in August for $195. For further information, or to order, contact DIJIT Systems, 4345 Hortensia St., San Diego, CA 92103 or (619) 295-3301.

Asgard releases V2.0 of Recipe Writer

Asgard Software has released Recipe Writer 2.0. The upgraded program has been rewritten in c99 and "completely changed," according to Chris Bobbitt of Asgard.

He says the new version features space for a full title, the oven temperature, 23 lines of ingredients and 23 lines of preparation instructions; a line for multiple keywords to describe the recipe; wildcard keyword search routine to allow the user to find all recipes with any given keyword even if it was misspelled; complete recipe editing utilities; complete print utilities; a conversion utility to convert the ingredient list by any factor (for instance, make a recipe for two into one that serves seven); the ability to build an index of recipes and compact if for searches of 15 seconds or less; and 100 percent compatibility with the Myarc Geneve 9640.

Minimum requirements for the program are a TI99/4A, 32K, TI Extended BASIC or Editor/Assembler and one disk drive. Printer is optional.

Price is $19.95 including shipping and handling.

Also available is the Electronic Chef series of companion disks for Recipe Writer 2.0.

Titles currently available are Southwestern Foods and Appetizers & Soups.

Scheduled volumes are Meat Dishes, Chicken Dishes, Side Dishes and Desserts.

All volumes, which require Recipe Writer 2.0, are $6.95 each, including shipping and handling.

Owners of the previous version may ob-

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Newsbytes

Continued from Page 33

tain Recipe Writer 2.0, which includes a new manual, for $5 and return of their master disk to Asgard.

For further information, or to order, contact Asgard Software, P.O. Box 10306, Rockville, MD 20850 or (301) 559-2429.

BBS in Ohio

The Penn Ohio Users Group operates a 24-hour TIBBS, according to Gary Karas of the group.

He says the board operates at 300/1200 baud with seven data bits, one stop bit and no parity. Phone number is (216) 755-8220.

5th Chicago Faire set

"The Computer that Refuses to Die!!" is the theme of the fifth annual Chicago TI99/4A Computer Faire from 9 a.m. to 6. p.m. Nov. 7 in the Ironwood Room of Triton College in River Grove, Illinois.

In addition to vendor booths and product information, the Faire will feature lectures, seminars and technical demonstrations and presentations. Subjects include Pascal programming, assembly language programming, TI-Artist and TI-Writer.

For further information, write the Chicago Area TI99/4A Users Group, P.O. Box 578341, Chicago, IL 60657, or leave a message on the group's 24-hour BBS, (312) 966-2342. For voice contact, call Grant Schmalgmeier, (312) 477-0690, 9:30-11:30 p.m. Central Standard Time.

Board number wrong

The phone number for the Miami Users Group BBS was incorrectly listed in the June issue. The correct number is (305) 255-6307.

Panic Button option

A Panic Button is now available for your TI (or any computer, typewriter or object that gives you frustration).

The button is a bright red computer key imprinted with the word "PANIC," with an adhesive backing permitting its attachment to any dry object.

It is available at $2.50 for two Panic Buttons from Memory Makers, 3024 Haggin St., Bellingham, WA 98226.

Armadillo BYTES

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User Notes

Connecting a 9640 to an Amiga

Walt Howe, of the Boston Computer Society, offers advice on modifying a cable to connect a Myarc Geneve to a Commodore Amiga monitor.

I bought an Amiga monitor, which works beautifully, to use with my 9640. The monitor comes with a skimpy manual which fails to give information on pinouts or even that it can be used as a composite monitor or a digital TTL monitor as well. A cable comes with the monitor. It has a 23-pin D connector on the console end an a 9-pin D connector and phono jack on the monitor end.

I built the cable by removing the 23-pin D and replacing it with an 8-pin DIN that the 9640 uses. (It may take some searching to locate an 8-pin DIN.) I also had to add a second cable with a phono jack on the monitor end. The correct pinouts are as follows:

9640 pins	23-pin D pins	Function
1	-	12V supply (DON'T USE)
2	16	Ground and audio cable ground
3	(jack)	Audio
4	-	Composite (not needed)
5	3	Red
6	4	Green
7	5	Blue
8	10	Sync

On the 23-pin connector, pins 17 through 20 are also used, but are not needed.

Remove the 23-pin connector from the monitor cable, noting which lead is which.

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AVATEX—

(Continued from Page 31)

ous areas such as what commands to test the modem's operations are and how they are to be interpreted. You will learn what and how to utilize the on-screen commands. The menu(s) built into one of the modem's 15 registers is fantastic. For those who might be wondering, the Avatex 1200/1200hc does not have a status register.. The settings described will more or less eliminate the need for one.

As for myself I shopped around for quite a while before and after this modem appeared on the market. First I was tempted by its price, then when I found out what you got for that price I was convinced that it was the best buy for the money, even if you do have to make a cable. If anyone desires any help or additional information I can be contacted on GEnie E-MAIL "JP GALLAGHER", CompuServe ID #73147,343 or my 24-hour SAGEsoft BBS at (509) 244-9209. By the way, can you guess what modem I'm using?

User Notes

Continued from Page 34

The red, green and blue leads are jacketed in cables of the same color within the monitor cable, which makes it easy to keep track. Use the red ground (pin 16) as the 9640 ground. Trim away unncessary leads, and trim all the leads you are using to the same length. Strip the ends, but keep the ends short. Similarly, trim your audio cable and lay it alongside the monitor cable.

Slip the 8-pin DIN connector shell over the two cables. I found it necessary to remove the sleeve from the shell to make it fit. I also clipped off the connector for pin 1 of the 8-pin DIN to prevent against any accidental short to the 12-volt supply, which could do some damage.

Carefully solder the connections as charted above. Solder the audio ground to pin 2 as well as the ground from pin 16. When you are through, check for shorts and reassemble the 8-pin DIN.

Rotate works with Instances

Steven Johnson, of Annapolis, Maryland, uses an Extended BASIC program he wrote to rotate TI-Writer Instances. Rotate can handle an Instance up to 110 characters.

To use the program just type in the filenames or use the defaults. The program will read in the Instance and rotate it a character at a time on the screen, then write it to disk in the proper TI-Artist Instance format and ask if you want to do another.

```
100 REM ROTATE   BY  S JOHNS
ON AND D WOOD * X-BASIC
110 REM rotates TI ARTIST IN
STANCEs 90 degrees.Run again
 180 degrees etc.
120 R$="0123456789ABCDEF"
130 DISPLAY AT(1,1)ERASE ALL
:"ROTATE   S JOHNSON & D WOO
D" :: DISPLAY AT(3,1):"INPUT
 FILE?  DSK1.FILENAME_I" ::
ACCEPT AT(3,14)SIZE(-15):F1$
140 DISPLAY AT(5,1):"OUTPUT
FILE? DSK1.FIL2NAME_I" :: AC
CEPT AT(5,14)SIZE(-15):F2$ :
: CALL CLEAR
150 ON ERROR 370 :: OPEN #1:
F1$,INPUT :: OPEN #2:F2$,OUT
PUT :: INPUT #1:W,H
160 IF (W*H)110)OR(W)24)THEN
 DISPLAY AT(9,1):"THIS INSTA
NCE IS TOO LARGE": :"TO ROTA
TE. SORRY........" :: GOTO 3
50
170 FOR M=1 TO H :: FOR N=1
TO W :: INPUT #1:A(0),A(1),A
(2),A(3),A(4),A(5),A(6),A(7)
180 Y(0),Y(1),Y(2),Y(3),Y(4)
,Y(5),Y(6),Y(7)=0 :: FOR R=0
 TO 7
190 Y(R)=Y(R)+(A(0)AND 1)*12
8 :: A(0)=INT(A(0)/2)
200 Y(R)=Y(R)+(A(1)AND 1)*64
 :: A(1)=INT(A(1)/2)
210 Y(R)=Y(R)+(A(2)AND 1)*32
 :: A(2)=INT(A(2)/2)
220 Y(R)=Y(R)+(A(3)AND 1)*16
 :: A(3)=INT(A(3)/2)
230 Y(R)=Y(R)+(A(4)AND 1)*8
:: A(4)=INT(A(4)/2)
240 Y(R)=Y(R)+(A(5)AND 1)*4
:: A(5)=INT(A(5)/2)
250 Y(R)=Y(R)+(A(6)AND 1)*2
:: A(6)=INT(A(6)/2)
260 Y(R)=Y(R)+(A(7)AND 1)::
A(7)=INT(A(7)/2):: NEXT R
270 X$="" :: FOR I=0 TO 7 ::
 B=INT(Y(I)/16)
280 X$=X$&SEG$(R$,B+1,1)&SEG
$(R$,Y(I)-B*16+1,1):: NEXT I
 :: CALL CHAR(33+K,X$)
290 CALL HCHAR(24-(K-INT(K/W
)*W),INT(K/W)+2,33+K):: K=K+
1 :: NEXT N :: NEXT M
300 ON ERROR 390 :: PRINT #2
:STR$(H);",";STR$(W)
310 FOR R=W-1 TO 0 STEP -1 :
: FOR C=1 TO H :: CALL GCHAR
(24-R,C+1,W):: CALL CHARPAT(
W,B$)
320 FOR I=0 TO 7 :: T$=SEG$(
B$,2*I+1,2):: A(I)=(POS(R$,S
EG$(T$,1,1),1)-1)*16+POS(R$,
SEG$(T$,2,1),1)-1 :: NEXT I
330 PRINT #2:STR$(A(0));",";
STR$(A(1));",";STR$(A(2));",
";STR$(A(3));",";STR$(A(4));
",";STR$(A(5));",";STR$(A(6)
);",";STR$(A(7))
340 NEXT C :: NEXT R :: CALL
 SOUND(110,262,0):: CALL SOU
ND(110,330,0):: CALL SOUND(1
10,392,0):: CALL SOUND(298,5
23,0):: CALL SOUND(10,40000,
30)
350 CLOSE #1 :: CLOSE #2 ::
CALL CLEAR :: CALL CHARSET :
: DISPLAY AT(2,1):"WANT TO R
OTATE MORE?(Y/N)N"
360 ACCEPT AT(2,26)SIZE(-1)V
ALIDATE("YNyn"):YN$ :: IF YN
$="Y" OR YN$="y" THEN K=0 ::
 GOTO 130 ELSE END
370 CALL CHARSET :: DISPLAY
AT(1,1):"**  DISK ERROR TRY
AGAIN!"
380 CALL SOUND(10,440,0):: F
OR DEL=1 TO 500 :: NEXT DEL
:: RETURN 130
390 CALL CHARSET :: DISPLAY
AT(9,1):"**  DISK ERROR WRIT
ING!" :: CALL SOUND(10,440,0
):: RETURN 350
```

A history of DM1000

The following "history" of Disk Manager 1000 comes from the Rocky Mountain 99ers. DM1000 is a Fairware disk manager. The program has enjoyed great popularity and has been revised numerous times. It's too bad not all programs get as much attention as DM1000. Depending on which version you've got, you'll see where you stand in relation to the evolution of DM1000.

Version 3.0, fixes Version 2.4

— Incorrect file count when going from 'M' to 'C.'

— File copy produced could be disastrous if the file being copied was stored on the master disk as a non-continuous file and the size of the first secment was exactly 39 sectors, with additional sectors located in another segment on the disk.

Version 3.1, fixes Version 3.0

— File copy would give a bad copy if the master file was a fractured file of exactly 39 sectors and the same file name was on the copy disk.

— When entering a file name in various modes it was possible to mess it up.

Unfixed bugs in Version 3.1

— Unable to display some DIS/VAR 80 files that contains lots of control characters. Computer hangs up.

Version 3.3

— Changed defaults on sweep and disk

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User Notes

(Continued from Page 35)

initialization.

— Read/Write errors get cleared after first use on disk copy.

— File 'MGR1' may now be called any name and all features of DM1000 will work. This works only with TI and Cor-Comp disk controllers.

— Loader for the Myarc disk controller is called LOADMY.

— During disk initialization menu, user may use the up arrow key to return to previous prompt.

Version 3.4

— Able to delete/copy/move one sector files.

— Adds 'up arrow active' notice when up arrow will return to previous prompt.

Version 3.5

— Able to type/print DIS/VAR and DIS/FIX 80 files while the file listing is on the screen by pressing 'T' for type (display) file to screen or 'P' to print to list device, with optional control codes sent to printer first. The 'P' and 'T' commands are valid in left-most field only.

— EOF (end of file) notice added to the lower lefthand corner of the screen.

— DIS/VAR and DIS/FIX 80 menu is removed.

Version 3.5 is the most recent update.

Stop it, I mean it

The following program, which appeared in the newsletter of the Pueblo Colorado 99'er User Group, tests the hand-eye coordination of the user. No, it's not really a test. It's a game. And it runs in BASIC. The are five columns, see, each headed by a letter of the alphabet, from A to E. Sprites representing the same letters, but randomly selected, appear from the left the screen and dart across the columns. The object is to stop each letter on the corresponding column. Much easier said than done. The game runs faster in Extended BASIC. The author of the program is unknown.

```
10 REM TI STOP-IT   TO SCROE
 PRESS "S" IN CORRECT COLUMN

20 CALL CLEAR
30 INPUT "NUMBER OF TURNS? "
:B
40 CALL CLEAR
50 REM SCREEN
60 FOR A=1 TO 5
70 CALL VCHAR(1,10+2*A,30,24
)
80 CALL HCHAR(1,20+2*A,96+A)
90 NEXT A
100 REM START GAME
110 I=INT(RND*5)
120 D=INT((RND*22)/2)*2+2
130 FOR A=4 TO 32 STEP 2
140 CALL HCHAR(D,A-2,31)
150 CALL KEY(1,KEY,STA)
160 IF KEY<>2 THEN 230
170 IF 24+2*I=A THEN 200
180 CALL SOUND(100,110,0)
190 GOTO 260
200 CALL SOUND(100,2000,0)
210 G=G+1
220 GOTO 260
230 CALL HCHAR(D,A,I+65)
240 NEXT A
250 REM NEXT TURN
260 T=T+1
270 IF B=T THEN 290
280 GOTO 100
290 PRINT "NUMBER OF TURNS:"
;B
300 PRINT "NUMBER OF HITS:";
G
```

VDPUTIL3 runs BASIC in XBASIC

The following program, by John Behnke of the Chicago TI99/4A User Group, appeared in the group's newsletter, Chicago TImes.

The program allows the user to run BASIC programs that use the characters 15 and 16 in Extended BASIC. Extended BASIC doesn't permit the use of these character sets since they are reserved for sprites. BASIC, of course, does not support sprites.

The program rewrites the CHAR and COLOR subroutines so that they are able to access character sets 15 and 16 in Extended BASIC. The BASIC program will run faster in Extended BASIC and larger BASIC programs that won't run with a disk system will run in Extended BASIC because of the increased memory.

After entering the program, save it in MERGE format (DSKx.VDPUTIL3,MERGE); load the BASIC program into Extended BASIC; merge VDPUTIL3 (MERGE DSKx.VDPUTIL3); save the program to disk and then run the program.

```
1 CALL VDPUTIL3
32250 SUB VDPUTIL3 :: CALL I
NIT :: CALL LOAD(8196,63,232
):: CALL LOAD(16360,80,79,75
,69,86,32,37,164):: CALL LOA
D(9491,100)
32260 CALL LOAD(9636,2,224,3
7,20,3,0,0,0,4,192,2,1,0,1,2
00,1,37,18,4,32,32,12,4,32,3
2,24,18,184)
32270 CALL LOAD(9664,200,32,
131,74,37,0,184,32,131,18,37
,19,2,3,0,2)
32280 CALL LOAD(9680,4,192,1
92,67,4,32,32,12,4,32,32,24,
18,184,216,224,131,75,37,0,5
,131,136,3)
32290 CALL LOAD(9704,37,18,2
2,242,192,32,37,0,2,1,37,2,1
92,131,2,34,255,254,4,32,32,
36)
32300 CALL LOAD(3726,4,192,2
16,0,131,124,2,224,131,224,4
,96,0,112):: CALL LOAD(8194,
39,4):: SUBEND
32310 SUB CHAR(A,A$):: A$=A$
&"0000000000000000"
32320 FOR B=1 TO 16 STEP 2 :
: C=ASC(SEG$(A$,B,1)):: D=AS
C(SEG$(A$,B+1,1)):: C=((C>57
)*7-48+C)*16(D>57)*7-48+D
32330 CALL LINK("POKEV",767+
8*A+(B+1)/2,C):: NEXT B ::
32340 SUBEND :: SUB COLOR(A,
B,C):: CALL LINK("POKEV",206
3+A,(B-1)*16+C-1):: SUBEND
```

Radio Shack keeps you cool

On the subject of keeping your console cool, Joe Nuvolini, of Colorado Springs, Colorado, writes: I read with some interest the User Note (June 1987) concerning cooling fans for the console. While I'm sure they work, they are really not necessary if you install the Radio Shack

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replacement switching power supply (Cat. No. 277-1016). They cost only $4.95, which is probably cheaper than the fan you need to cool the console with the original power supply. This new one runs cooler because it will handle a bigger load.

I found this out in a round-about manner. I read an article in the LA 99ers TopIcs by Ken Hamai about running a TI full height drive with one of these power supplies. You simply hook up the 12 volt and 5 volt outputs to the corresponding drive inputs along with the ground.

To run the Radio Shack power supply you need to connect a 12.6 volt 3 amp transformer to the red and white input wires of the power supply. This transformer (Cat. No. 273-1511) costs $6.99 at Radio Shack. You should also put a one-half amp fuse on the input line of the transformer to protect the circuit.

I hooked it all up and it worked just fine. I formatted a disk and copied Funnelweb, a rather full disk, to it. I tried the same thing with the original TI console power supply and it would not support the drive operation. It became hot and the voltage dropped to a point where the system could not read or write. If you think about it, the whole power supply costs only $11.94. That's a lot cheaper than going out and buying one. I mounted the components on a short piece of 1x6. One caution — be sure to hook the 5 and 12 volts up correctly, or you can blow your drive if you happen to attach the 12 volts from the power supply to the 5 volt input of the drive.

In any event, continuing with my original thought on the cooling fan, since the Radio Shack power supply has a greater output capacity it works less and runs cooler in the console. Why pay $14.95 for a cooling fan when you can accomplish the same result by just changing the power supply?

(As Nuvolini demonstrates, there's more than one way to skin a cat or cool a computer — Ed.)

Tips on using CTRL U and Disko

Gerard Volbrecht, of Les Granges, **France, writes: You published** a User Note from I letter a wrote about Multiplan (February, 1987)...but I must correct on point. Recently, I found that it is possible, using the method I explained, to access the files OVERLAY and MPHLP from an Horizon RAMdisk — even if it is set at a CRU address different than >1000. I had tried that before...and it had failed. Today it works. I have not been able to figure out where I was wrong when I tried it the first time, but I was wrong.

I add two little tips to help you forget my mistake.

About TI-Writer: In his article, "Taking control of CTRL U" (September, 1985) William J. Bullock wrote that the greatest difficulty with the assignment of CTRL U keys to printer commands is that the in-text symbols that TI-Writer displays on the screen for these keys have no logical relationship to the printer commands they generate.

Using a sector editor, it's possible to change the pattern of the characters displayed in the CTRL U mode by editing the CHARA1 file that comes with the TI-Writer update. The pattern of each character takes eight bytes. The pattern of the first one (code 0, produced with SHIFT 2 while in the CTRL U mode) begins on the seventh byte of the file. So, you can display on the screen meaningful symbols for the printer commands, like the ones TI-Writer provides for Line Feed and Carriage Return, even icons or reverse video letters. (See Page 22—Ed.)

About the sector editor DISKO: The version I got was designed for use with a SSSD drive — the program would accomodate only 360 sectors. To set this default number to 720 sectors, change the bytes >0167 to >02CF. On my version, modified for a GRAM device, I found these bytes on the tenth sector of the file.

Character shifter

We're not sure what you will do with this routine, but Character Shifter, by Jerry Macdonell of Kirkwood, New York, may have some uses in Extended BASIC programs. As presented here, the program adds a 00 to the beginning or end of a string of 94 displayable ASCII characters (33-127). After the ASCII characters are displayed, each character will either rise or sink. The 00 in lines 130 and 140 may be replaced by any hex code. You may want to substitute FF so that a solid block will replace each character as it flies away.

```
10 REM ----------------
20 REM CHARACTER SHIFTER
30 REM ----------------
40 CALL CLEAR :: PRINT "UP O
R DOWN (1 OR 2)?" :: PRINT "
 "
50 ACCEPT AT(24,1)VALIDATE(D
IGIT):A
60 IF A>2 THEN 50
70 CALL CLEAR
80 FOR I=1 TO 3 :: FOR U=33
TO 127 :: PRINT CHR$(U);:: N
EXT U :: NEXT I
90 FOR I=33 TO 127
100 X=INT(10*RND)-5 :: Y=INT
(10*RND)-5 :: CALL SPRITE(#1
,I,2,98,120,X,Y)
110 FOR Y=1 TO 8
120 CALL CHARPAT(I,A$)
130 IF A=1 THEN B$=SEG$(A$,3
,14)&"00" :: GOTO 150
140 B$="00"&SEG$(A$,1,14)
150 CALL CHAR(I,B$)
160 NEXT Y
170 CALL DELSPRITE(#1)
180 NEXT I
```

MIN and MAX in console BASIC

Floyd Donaldson, of Buckingham, Quebec, notes that BASIC doesn't have the MIN and MAX functions supported by Extended BASIC. But he doesn't let that get him down. To provide the function in BASIC, he wrote two lines of BASIC code. The code is in lines 100 and 110 of the following routine. In the formulas, N1 represents the first number and N2 represents the second number. The result of the operation is returned in the name of the functions in lines 120 and 130. It doesn't matter whether the high number occurs in N1 or N2.

```
70 INPUT N1
80 INPUT N2
100 MIN=((N2<=N1)*-N2)+((N1<
N2)*-N1)
```

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```
110 MAX=((N1>=N2)*-N1)+((N1<
N2)*-N2)
120 PRINT MIN
130 PRINT MAX
```

ENVITEST reports environment

The following program, by William J. Wallbank of Duxbury, Massachusetts, allows the user to determine whether the programming environment is BASIC or Extended BASIC. Also, it provides a resolution to the "PI token identity anomaly." In Extended BASIC, PI is a reserved word and has an identity. In BASIC, PI is a variable which requires a computed value to be assigned to it. Moreover, by using the environment routine, speech programs may be written which will function in either BASIC or Extended BASIC environments. Wallbank writes:

This demo program uses techniques I've developed to permit a program to identify its environment and branch accordingly. For instance, a program with tagged assembly language code will execute in Extended BASIC yet ignore the code in BASIC. Or you can run a BASIC only program by including the VDPUTIL2 subprogram (see User Notes February, 1986), which will be called only if in the Extended BASIC environment, such as C. Regena's Teeth Wisdom. One version does all, excepting very large programs.

The PI token identity code does work, but awaits another's more elegant solution.

Now you can easily write a program which will auto-select whether to access the Terminal Emulator II or the Extended BASIC speech synthesizer mode, as per sample.

Except where noted, enter this program in Extended BASIC. Lines calling for entry from BASIC should be entered first. Then load Extended BASIC, load the program with its BASIC lines and enter the remaining lines.—Ed.

PROGRAM EXPLANATION

120 — Resents RND to a known first value. Program looping and Extended BASIC program chaining might otherwise step to the next RND value.

130 — V82 in BASIC, while V21 in Extended BASIC.

160 — Sample only. Name and merge in yhour subprograms first. Then name and put your disk utilities on-line. The routines and utilities must be co-existable. CALL INIT can be called only once.

200 — Enter this line from BASIC.

230 — Enter this line from BASIC. Assigns the computer value to the BASIC variable PI.

250 — Enter this line from BASIC, and any successive PI.

280 — Assumes that both the TE2 and the speech synthsizer are on-line.

310 — If the speech synthesizer is connected, then this address holds a non-zero value. (Thanks to Craig Miller.)

```
100 CALL CLEAR
110 REM  * IDENTIFY THE ENVI
RONMENT *
120 RANDOMIZE (0)
130 V=INT(RND*100)
150 IF V<>21 THEN 180
160 CALL INIT :: CALL VDPUTI
L2 :: CALL LOAD("DSK1.PDUMP"
)
170 REM * ID PI TOKEN *
180 IF V=82 THEN 230
190 XPI=PI
200 PI=XPI
210 L$="XBASIC PI="
220 GOTO 250
230 PI=4*ATN(1)
240 L$="BASIC PI="
250 PRINT L$;PI
260 REM * ID SPEECH MODE *
270 IF V=21 THEN 300
280 OPEN #1:"SPEECH",OUTPUT
290 GOTO 330
300 REM * CHECK SP. SYN. *
310 CALL PEEK(-28672,SP)
320 IF SP=0 THEN PRINT "SPEE
CH SYN. NOT CONNECTED!"
330 FOR W=1 TO 3
340 READ SP$
350 IF V=21 THEN 380
360 PRINT #1:SP$
370 GOTO 390
380 CALL SAY(SP$)
390 PRINT SP$
400 NEXT W
410 IF V=21 THEN 430
420 CLOSE #1
430 END
440 REM * DATA AREA *
450 DATA HELLO,GOODBYE,END
30001 SUB VDPUTIL2
30002 REM THANKS TO
30003 REM JOHN BEHNKE
30004 REM
30099 SUBEND
```

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